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REFUGEE SETTLEMENT IN THE
DOMINICAN REPUBLIC

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Refugee Settlement in the Dominican Republic

A SURVEY CONDUCTED UNDER
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FOREWORD

In the fall of 1940 The Maurice and Laura Falk Foundation of Pittsburgh made a grant to the Brookings Institution to finance a study of the economic problems involved in settling refugees in the Dominican Republic under the contract concluded in January 1940 between the government of that country and the Dominican Republic Settlement Association. The survey as a whole was conducted under the direction of Dana G. Munro, director of the School of Public and International Affairs of Princeton University.

The staff organized to carry out this study was divided into two general sections, economics and agriculture. The economic phases of the work were conducted by Harry B. Smith, formerly of Case, Pomeroy and Company; Ellis Goodwin, formerly in the Financial Adviser's office in Haiti and more recently in the United States Department of Agriculture; and John Gange, of Stanford University, specialist in Latin-American history. The agricultural work was headed by Atherton Lee, director of the United States Department of Agriculture's Experiment Station in Puerto Rico. Collaborating in the agricultural studies were James Jensen, professor of plant pathology at the University of Nebraska, and George Burkhardt, agricultural engineer of the University of Maryland. Joseph Schneider, formerly of the Institute of Technology of Prague, and now of Madison College, was appointed to make a study of industrial problems.

It is difficult to assign specific responsibility for some chapters, in view of the close co-operation among staff members in the several phases of the investigation. Chapters I, II, III, XV, and XIX were done by Harry B. Smith. Chapters IV and V were primarily the work of John Gange, and Chapters XI, XII, XIII, XIV, and XVI were done by Ellis Goodwin. Mr. Schneider gathered the detailed information on industries. The agricultural sections are naturally the result of collaboration among the various specialists on the staff. The temperature and rainfall charts illustrating climatic factors in agricultural production, which are presented in Appendix A, are based on the data of Mr. Burkhardt.

The principal questions which the survey had to consider were: (1) What is the relation of the Dominican project to the refugee problem as a whole? (2) Is the Dominican Republic a suitable place for refugee settlement? (3) How may refugee immigrants make a living there? (4) How many settlers can the Republic absorb? (5) What will be the effect of the settlement project on the Dominican community?

An answer to the first question required a study of the refugee problem in general. This is presented in Part I. Part II is a detailed study of the history and the present economic situation of the Dominican Republic itself. To form an idea of the possible future of the refugee colony it was necessary to know something of the history and manner of life of the people among whom the refugees were to settle. It was equally important to investigate the main features of the country's economic life and resources, agricultural and industrial production, financial organization, and labor conditions. The factors which determine the standard of living of the people of the country at present will also affect its capacity to absorb immigrants. A study of the country's agriculture and the possibilities for its development was especially important, because agriculture must obviously be the principal occupation of the great majority of the newcomers, as it is of the overwhelming majority of the present inhabitants. It was also essential to know something of existing industries and opportunities for industrial employment, and something of the practicability of establishing new industries. Studies of national wealth and income would throw light on the possible markets for such products as the settlers might raise. Part III deals more particularly with the problems of the Sosua colony.

The survey had to consider especially the question whether the settlers will be able to maintain a standard of living under which people of European origin can sustain health and morale. This is not an easy matter for people who must live by their own labor in a tropical country, and especially in a community where the majority of the present inhabitants are poor and standards of living low. With proper management the production of an adequate food supply is perhaps not particularly difficult, but to obtain a cash income for the purchase of necessities which the settlers cannot

make for themselves is another matter. Many articles which are necessities to Europeans or North Americans are unattainable luxuries to the average Dominican, and such articles cannot be obtained by the settlers unless they can produce and sell a surplus over and above what they consume as food. Furthermore, if the colony is to be at all successful, the settlers must also be able to make payments on the debts which they will contract with the Settlement Association, and in some cases at least to accumulate some small capital of their own. To do this they must either have money crops for which there is a market in the Dominican Republic or abroad, or such small industries as can be established in the country with a moderate outlay of capital.

The agricultural section of the survey therefore gave careful consideration to possible money crops, and the economic section investigated the condition of the industries now existent and the problem of establishing new ones. The suggestions herein made regarding agricultural and industrial possibilities, however, are not limited to those which would be especially appropriate for the settlers. We have considered it a part of our task to investigate also agricultural or industrial possibilities through which the general standard of living and welfare in the Republic as a whole might be advanced. The prosperity of the settlement will of course depend upon the prosperity of the Republic.

During their stay in the Dominican Republic, the members of the survey endeavored to give the Sosua Settlement assistance in various ways. Mr. Lee had already taken an active interest in the colony's agricultural work before the survey began, and the other members of the agricultural section spent much time at Sosua giving advice and even helping in the work of planting. Mr. Schneider conferred with the settlers about industrial possibilities, and Mr. Smith assisted the administration in dealing with several practical questions.

Throughout our investigation we have borne in mind the fact that no policy should be recommended which would involve the settlers in harmful competition with existing enterprises or industries, and that every effort must be made to make sure that the final result of the colony's establishment is an increase in the Re-

public's national wealth and a general improvement in the condition of its people. There seems to be no reason why such results should not follow from the introduction of a moderate number of intelligent Europeans ready to add to the country's productive capacity by their own labor, especially as the settlers will bring with them, thanks to the generosity of the Settlement Association, a considerable amount of the new capital which is a first requisite for the country's development.

It should be emphasized that this report deals only with the economic aspects of the problems with which the settlers are confronted. Other questions, such as the attitude of the Dominican people toward foreign immigration, and the relation of the settlers to the country's political life, are of course of the greatest importance, but they are outside the scope of our study.

Furthermore, the report deals only with questions related to the refugees coming to the country under the Dominican Republic Settlement Association contract. Many other refugees, including a large number of Spanish loyalists, have been admitted to the Republic, but their problems were outside the scope of our inquiry. In stating this, however, we cannot refrain from mentioning the fact that the situation of the Spanish loyalists is an exceedingly difficult one. It is to be hoped that funds may become available to expand the efforts which the American Friends Service Committee is making to assist them.

The members of the survey wish especially to express their appreciation and thanks for the help received in this investigation from all officials of the Dominican government with whom they came in contact. Without the facilities which the government freely placed at their disposal, it would have been impossible to obtain much of the essential material. In this connection particular mention is due the Oficina General de Estadística Nacional, and Director Vicente Tolentino R., for the helpful and effective co-operation accorded at all times.

Special acknowledgment is also due to the officers and staff of the American Legation, to the Dominican Republic Settlement Association, and to the business and professional community of the Republic, native and foreign. The resident directors of the Bank

of Nova Scotia, the Royal Bank of Canada, and The National City Bank of New York were especially generous in their willingness to compile information not elsewhere obtainable.

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PART I

THE ECONOMICS OF REFUGEE SETTLEMENT

CHAPTER I

ORIGIN AND MAGNITUDE OF THE REFUGEE MOVEMENT

This survey is concerned primarily with the future of the refugee rather than the past, but some background is essential to a proper understanding of the subject. Areas and countries of refugee origin, initiating forces, and basic causes of the movement all have a direct bearing upon the problems of resettlement and rehabilitation. The present economic condition of the refugee as well as economic and social adaptability are likewise important factors. Owing to the complex nature of the movement, the term itself requires definition.

By and large, refugees may be grouped in two broad categories—those temporarily dislodged, and those permanently uprooted. The former may ultimately return to their homes; the latter cannot. The first group is largely made up of war refugees, that is, people temporarily expelled from theaters of war. The second is composed mainly of political or religious refugees in voluntary or involuntary flight. Between the two is a third category best described as the potential refugee. This group was recognized by the Intergovernmental Committee as “persons who have not already left their country of origin but who must emigrate on account of their political opinions, religious beliefs, or racial origin.”¹ The war refugee as such constitutes a relief problem outside the scope and purpose of this report, but the political refugee, existing or potential, directly concerns it.

During the past 25 years the world has witnessed the uprooting and transplanting of peoples on an unprecedented scale. Since 1914 the process has been almost continuous over a wide area. In the aggregate, vast numbers have been compelled to abandon homes where they have long been established, sacrifice property, and

¹ An intergovernmental conference to deal with the problems of political refugees was convened at Evian in July 1938 at the suggestion of President Roosevelt and was organized as a continuing body under the title of Intergovernmental Committee on Political Refugees.

seek temporary or permanent refuge from disturbance or oppression of one sort or another.² Seldom if ever in history have political and racial minorities been under more insistent pressure to move; seldom has there been greater economic urge to migrate; and seldom if ever has the freedom of human movement throughout the world been more restricted. Partly in consequence of the latter, many sizable movements have been purely national. But at the same time, and despite universal obstacles and restrictions, the compulsion and the urge to move have been sufficiently strong to force large numbers across international frontiers.

The migrations of the past quarter-century had their center and origin in the densely populated areas of Europe and Asia. These migrations were directly a product of the economic, social, and political turmoil that dominated both continents throughout the entire period. War, economic distress, social upheaval, revolution, and war have succeeded each other in a rising crescendo within that vast area bounded roughly by the eastern Atlantic, the western Pacific, the Arctic Sea, and the Equator. The Russian revolution, the redrafting of European frontiers and consequent dislocations, the Fascist revolt in Italy, the Japanese invasion of Manchuria and China, the Nazi revolution in Germany, the Spanish civil war, the prewar Nazi aggressions, and now a second great war, all in turn dislodged, uprooted, and set in motion vast numbers of people. That the bulk of the movement was confined within two continents merely shifted, rather than relieved, the pressure from which these disturbances basically arose.

² Estimates of the refugee movement immediately following World War I range from 3½ to 5 millions, excluding war refugees at liberty to return to homes abandoned in the various theaters of war. This probably does not include the subsequent ejection of large numbers alienated by the redrafting of frontiers, such as Germans ejected from the western area of Poland, or huge refugee migrations from the Far East. The following is a partial list of known movements compiled from Buel W. Patch, "Resettlement of Refugees," *Editorial Research Reports*, Vol. 1 (1938), No. 14.

Russians	1,500,000
Greeks (from Asia Minor)	1,500,000
Armenians (from Asia Minor)	350,000
Bulgars (from Greek Macedonia)	200,000
Moslems (from Greece to Turkey)	375,000
Syrians	25,000
Saarländers	3,500
Total	3,953,500

It has been said that every political régime has its economic counterpart, and the economic counterpart of totalitarianism is even more revolutionary than the political system it complements. From the standpoint of the subject under review the dominant economic fact is the introduction of a system of conscript labor and the systematic economic exploitation of minority peoples, both as an instrument of policy and as a basic element of a New Order to be imposed upon Europe. The inevitable product of such a system is an increase in the number of people desiring to migrate and a decrease in both their ability and their prospects of doing so. The system expels those it does not want or cannot use, but only after confiscating property and savings.³ The penniless exile immediately becomes the refugee, and this impoverishment of the refugee directly conditions every phase of any effort to resettle him.

So long as people were able to migrate with goods, chattels, and savings, and settle down in another country, large-scale emigration from Europe was possible. During the past hundred years millions of Europeans have emigrated to overseas countries. From 1841 to 1940 the United States alone took almost 33 million from Europe and Asia out of its total immigration of 37½ million (see table on page 6).⁴ Additional numbers of Europeans found new homes by the same process in Australia, Africa, Canada, and South America. But large-scale settlement of European emigrants, sharply checked by world-wide immigration restrictions during and following World War I, is now all but halted by totalitarian practice. The non-Asiatic and non-European world will not accept any appreciable volume of emigrants from areas that export either penniless refugees or the products of forced labor, or both.⁵ With opportunities for ordinary infiltration impeded or closed, the alternative is organized mass colonization and settlement of refugees in available and suitable areas.

³ In December 1938, the amount of property the Jewish emigrant could take with him from Germany was only what remained after deducting the following levies: 25 per cent loss on sale of property, 25 per cent flight tax, and 90 per cent loss on the remainder after conversion into foreign currency.

⁴ The annual quota of immigrants allowed to enter the United States is now 153,774, of which about 150,000 is assigned to Europe and Russia.

⁵ A universal requirement for alien entry into all countries is that the alien will not become a public charge. The presence of forced labor products in world commerce further reduces alien prospects of admittance into many countries and their opportunities of finding work.

Historically the record of organized colonization is discouraging from the standpoint both of numbers than can be emigrated by this process, and of the well-being of those so relocated.⁶ Of the millions who have migrated from Europe and Asia since the fifteenth century era of discovery, mass colonization projects account for but

IMMIGRATION INTO THE UNITED STATES, BY DECADES, 1841-1940^a

Period	From Europe	From Asia	From All Sources
1841-1850	1,597,501	82	1,713,251
1851-1860	2,452,660	41,455	2,598,214
1861-1870	2,065,270	64,630	2,314,824
1871-1880	2,272,262	123,823	2,812,191
1881-1890	4,737,046	68,380	5,246,613
1891-1900	3,558,978	71,236	3,687,564
1901-1910	8,136,016	243,567	8,795,386
1911-1920	4,376,564	192,559	5,735,811
1921-1930	2,477,853	97,400	4,107,209
	31,674,150	903,132	37,011,063
1931-1940 . . .	337,533	13,343	485,413
100 years . . .	32,011,683	916,475	37,496,476

^a Figures for 1841-1930 from U. S. Department of Labor, *Statistical Abstract of the United States*, 1939, p. 100; for 1931-40, from the Immigration and Naturalization Service.

an infinitesimal percentage. Few of these ventures have had a happy ending for the migrant, and many have ended tragically.⁷

There appear to be two basic causes of failure. First, unlike in-

⁶ By mass colonization is meant an organized undertaking to transport and permanently establish a large number of settlers in a foreign country. Such an undertaking usually contemplates supplying tillable land to settlers—either free or on a purchase basis—or providing some other means of livelihood. In the past, such projects have usually been organized for gain and therefore contemplated mass settlement under pioneering conditions over a relatively short period of time. Projects of this kind should not be confused with self-organized groups who, to escape political or religious persecution, have sought land, safety, and refuge abroad for self-development.

⁷ "From the early sixteenth century white settlers poured into the tropics, to be defeated in most cases by indigenous races, climate, disease, diet, isolation, maladministration, and faulty economic policies." A. Grenfell Price, *White Settlers in the Tropics* (1939), p. 13.

Madariaga describes the fate of Isabela, the first white settlement in the Western Hemisphere, established by Columbus on his second voyage in what is now the Dominican Republic.

" . . . And when the little town was beginning to take shape, it was visited by its first affliction—an epidemic. Little is known about it save that it affected nearly all the settlers. They attributed it to the overwork caused by the building up of Isabela and by the lack of adequate food." Salvador de Madariaga, *Christopher Columbus* (1940), p. 274.

filtration, which has been mainly confined to temperate zones, colonization projects have been largely concerned with the settlement of Europeans in tropical and subtropical areas. Second, almost without exception the projects have been poorly conceived, badly organized, and inefficiently administered. Initially, colonization of this type followed the course of discovery and the mythical lure of tropical abundance. Later it turned to the tropics as the only area open to organized emigration. In the main these ventures were of a pioneering nature, imposing violent climatic and environmental change upon the white European emigrant. Today, the attendant risks are still high even with the most competent organization and management. The absence of one or the other, or both, courts, if it does not insure, failure.

The growing dilemma of European emigration arises from the fact that circumstances and conditions increasingly restrict settlement in the temperate zones by infiltration and increasingly force resort to methods and zones of settlement that have failed in the past to provide for any great volume of people. It seems highly probable that channels of infiltration will continue to narrow, especially for those under the greatest necessity to emigrate. If Germany should win the war, all Europe may be brought under a system which, while it might permit the exit of persons, is not likely to permit the free exit of their property. Without resources, few will be eligible immigrants into non-European areas that after the war are more likely to tighten than to modify immigration restrictions. If Germany loses, the situation may be much the same, for, while more people may be free to emigrate, the potential areas of final settlement may well be further curtailed.

As the war progresses and spreads, emigration from Europe, now severely curtailed, becomes more and more difficult, and may conceivably cease altogether. The real task of resettling Europe's surplus population has already become one of the postwar problems. Effective relief from population pressure in Europe can only be obtained by the transfer of people to non-European areas. A German victory would unquestionably carry with it prompt, vigorous, and harsh action for the disposal of unwanted persons. Depending upon the scope of victory, Germany might be in a position to dump, or resettle, such population as it intends to move. If the former,

other nations will be faced with a resettlement problem. If the latter, there is always the possibility that Germany would undertake large-scale resettlement under circumstances and conditions that would be neither in the interest of those so settled or to the liking of indigenous populations. If Germany is defeated, non-European nations of the temperate zone will be faced with the choice of accepting or rejecting European infiltration, or of organizing colonization projects elsewhere for the settlement of such European emigrants as are able to migrate.

Regardless of the outcome of the war, therefore, it seems likely that European emigration will be increasingly dependent upon some form of colonization. The area of colonization is more likely to be tropical than temperate in climate. Many of the basic causes of past failures to settle white Europeans successfully in tropical and subtropical countries are known. Improvement in transportation and advance in medicine have eliminated the former dangers and risks of isolation. Current knowledge of housing, sanitation, hygiene, and diet materially reduce the danger of disease. Agromomic research has contributed a wealth of knowledge on conservation of soils and agricultural yields. But the experience and knowledge acquired since the early settlements will not apply itself. The very essence of modern white colonization in the tropics is the organization, co-ordination, and application to the effort of all that invention, science, and experience have contributed and can contribute to the subject. At best, the risk remains high, for we still have unconquered disease, the unsolved mysteries of climatic and racial influence upon white settlers, a confusion and conflict of economic, social, and political theory and practice, and war. The further conquest of disease must be left to medical research. The influence of tropical climate and indigenous races upon European whites must be tested further under conditions of modern colonization. This survey cannot contribute to the first, but it may be able to make some contribution to the second, by outlining some of the essential elements of organization in which are incorporated both the teachings of the past and the basic economics of refugee settlement at the present time.

CHAPTER II

ORGANIZATION OF REFUGEE SETTLEMENT

The tropical settlement of large numbers of impoverished people presents a problem of extraordinary complexity. Such an undertaking has to do with government, finance, transport, engineering, sanitation, supply, housing, agriculture, and industry. It must deal with less tangible things, such as climate, and environmental and vocational change as they affect the health and the economic activity of the settler. It will have obligations and responsibilities of a social nature which it cannot safely evade or ignore. All these are interrelated parts of a whole, and if a repetition of past failure is to be avoided it will require the co-ordinated effort of all concerned, the application of science and experience, and thorough preparation.

But co-operation among such widely diverse elements does not effect itself. The one catalytic agent essential to the fusing of the elements has still to be supplied. To bring them together, to co-ordinate the effort, to give practical application to the result, is a matter of comprehensive organization and competent administration. In short, while the essence of the problem of refugee settlement is the mobilization and application to the effort of essential human, material, and natural resources, the medium through which this is primarily accomplished is organization and management.¹

In the planning of great humanitarian projects, interest in the thing to be done frequently outweighs consideration of the means of doing it. The mechanisms of accomplishment are either taken for granted or crudely and inadequately designed. The most serious defect in modern economic and social planning is this tendency to elaborate objectives in all but total disregard of means of attaining them, for too often the practice leads either to dismal failure or to the conclusion that any means are justified by the end in view.

¹ "The whole experience of immigration countries goes to prove that the direct introduction of immigrants for the purpose of settlement has never succeeded without proper organisation." International Labour Office, *Technical and Financial International Co-operation with Regard to Migration for Settlement*, Report of Technical Conference of Experts, Series O (Migration) No. 7 (1938), p. 10.

Refugee settlement as it has developed to date is primarily a great humanitarian movement inspired by compassion on the part of individual groups for the oppressed and persecuted, and powered in the main by contributions of private philanthropy. Under the circumstances, it was almost inevitable that a certain amount of impractical idealism should invade the field of practical operations. But if the purpose is to transplant large numbers of people under conditions most conducive to economic independence, the maintenance of health, and future security, impractical idealism must ultimately give way to practical organization and expert operation of the undertaking.

The term "organization" is used here to designate the structure within which all the components of a problem or undertaking are drawn together, arranged in operating order, and made to function. The purpose of organization is to provide a comprehensive, effective, and orderly design of procedure. Because refugee settlement is a matter of great complexity, its organization is likewise a highly complicated matter. It has many of the elements of a general staff problem involving the care, movement, disposition, and employment of large forces, in that each must take into account all possible contingencies and eventualities and be prepared to meet them. It is even more difficult, for its powers are limited to negotiation and persuasion rather than absolute authority and discipline, and its financial resources are likewise limited. But both deal with the lives and destiny of men and both depend for success upon organization of the problem and its ensuing development by orderly and effective procedure.

I. RELATIONS WITH GOVERNMENT

A basic element in the whole settlement problem is government. It is government which exercises sovereign control over policies relating to emigration, immigration, and kindred matters; over the person, property, documentation, and movement of the individual as a national in or from countries of origin, as emigrant or refugee in countries of transit, and as an alien, until naturalized, in the country of final destination. As a result there are two basic spheres for organization involving government, the one intergovernmental,

and the other having to do with relations between the settlement agency and countries of origin, transit, and destination.

Intergovernmental organization. The organization of intergovernmental co-operation for the transfer of nationals of one country for permanent settlement in another can only be effected through bilateral or multilateral agreement between governments themselves. Since 1914 international agreements of this nature have been rare. Emigration and immigration countries are prepared to co-operate only if they regard it in the national interest to do so, and national interests in this respect of recent years have seldom been identical.

Considerable success has attended particular instances mainly involving the repatriation of nationals. Through agreement of governments concerned, a substantial resettlement of Greek, Russian, Armenian, and other Near East refugees was effectively organized by the League of Nations and the Nansen Office. Through direct bilateral agreement, other exchanges of nationals were effected after the last war; but, in the main, governmental action was directed more toward immigration restriction than the facilitation of emigration. Economic depression only served to confirm and strengthen this trend, while the subsequent rise of totalitarianism in central Europe further complicated the problem.

In 1937 the Governing Body of the International Labour Office decided to convene a technical conference of experts to study the question of "technical and financial international co-operation with regard to migration for settlement." In 1938 the experts stated: "International co-operation cannot begin until the emigration and immigration countries are ready to organise it."² The Intergovernmental Committee on Political Refugees³ was wrestling with this identical problem when the war intervened.

It seems fairly obvious that organized intergovernmental co-operation is essential to the orderly resettlement of people on a large scale. Whether peace will restore that community of interest upon which co-operation depends cannot be determined at this time. In the meanwhile there is reason to believe that the political

² I.L.O., Series O (Migration) No. 7, p. 7.

³ See note 1, p. 3.

changes and population shifts which are taking place within Europe may ultimately affect the whole problem of emigration and its organization, depending upon the outcome of the war. Another'important' arises out of the decentralization of urban and industrial population as a result of aerial warfare and the ultimate effect of so fundamental a change upon national economies. Whether all these changes will survive the war, and what effect they will have on emigration if they do, are matters which cannot be determined now any more than can the corollary attitudes and issues regarding postwar immigration. The known facts are that the organization of intergovernmental co-operation for orderly resettlement of migrants has been difficult to attain in the past and is nonexistent at present, and that voluntary organization in the future will as always depend upon the creation of a community of interest that cannot now be foreseen.

Settlement agency relations with government. Whatever agency is entrusted with or undertakes the re-location and settlement of a substantial number of people will have to deal with government from the inception of the movement to its conclusion, regardless of the nature of the agency. To function effectively and economically these relations must be organized and given legal form and status. If based upon some form of intergovernmental agreement to facilitate and promote settlement, organization will be greatly simplified, but in the absence of such agreement it will be a highly complex and difficult matter.

In varying degree the settlement agency will be in contact with government at three vital points. The first is with the government of settler origin, which is in sole control of proper documentation, orderly exit, and transfer facilities for settler property. If there is to be an effective system of emigrant selection it must be arranged with the country of origin.

The second point of contact is with the government or governments through which emigrant traffic may have to pass en route to destination. Normally the emigrant would not leave his own country until fully documented and financed through to ultimate destination. Under ordinary circumstances transit traffic of this character, where necessary, is a routine matter fully covered by the

international traffic conventions and requiring little more than administrative supervision by the emigrant agency. But with the violation of the conventions by the dumping of unwanted, undocumented, and penniless people upon neighboring states, and with strict control and limitation of immigration, a new situation is created. Even without dumping, the introduction of exchange controls complicates the transit and settlement problem. Combined, such measures have imposed a heavy burden upon transit countries in recent years. Instead of transit revenue, the countries have had the care and support of a great number of refugees. Unless the traffic is again regularized by intergovernmental agreement and co-operation, the settlement agency, particularly any agency for refugee settlement, will of necessity be forced to assume a large responsibility.

The third point of contact is with the government of the country in which settlement is contemplated. Here contact will be close, for the agency will be resident. Something in the nature of a charter or concession must be negotiated stipulating the terms and conditions of immigration for settlement and general operation of the undertaking. On the one hand, the settlement agency will wish to secure concessions and exemptions in aid of the project, a definition of its own and the settlers' rights and interests, and protection against discriminatory action by government. On the other hand, government will wish fully to preserve its sovereign prerogatives, and to be guaranteed against all financial responsibility for either settlers or the settlement agency.

Unless the settlement agency can obtain the co-operation of government at these three vital points of contact, the prospects of successful colonization are highly dubious. Without co-operation of the country of origin, an orderly flow of emigration is difficult to arrange, selection of the kind of settlers most likely to survive and prosper is defeated, and the financial burden of settlement is greatly enhanced. Without the co-operation of countries of transit, where transit is involved, the movement is either blocked or becomes more largely a relief operation than a settlement undertaking. The third is obvious, for unless co-operation is forthcoming from the government of an area suitable for settlement, settlement is clearly

impossible. And the conditions upon which the organization of these relationships depend is equally clear, for in the final analysis government will co-operate only where its interests are served.

II. ORGANIZATION OF THE SETTLEMENT AGENCY

The sole purpose of a settlement agency is to facilitate the migration and settlement of people. It is organized to deal with government only because government is the first avenue of approach to the basic task of bringing men and land together. Organization of the agency from this point must be directed to its major purpose, and the form it takes will, of necessity, be largely if not wholly governed by the type of settler it intends to aid and the kind of settlement it proposes to undertake.

From an international standpoint the migratory movement of peoples can be divided into three principal categories. The first consists of wage earners seeking economic betterment in another country. Despite immigration restrictions and foreign exchange controls, this group constituted the great majority of emigration between the close of the last war and the outbreak of the present conflict. In the main they have moved as individuals with sufficient capital to re-locate themselves, enough initiative and energy to surmount the obstacles to travel, and in general without organized effort. As a rule, this group drifts into the industry or trade of the country of destination.

The second category consists of candidates for settlement abroad on the land. They are a highly selective group, experienced in agriculture, and with some capital of their own. It was this group that primarily interested the Technical Conference of Experts convened in 1938 by the International Labour Office of the League. Successful settlement of those within this category requires extensive organization.

The third category consists of refugees of all types, political, religious, and war refugees, both actual and potential, and both voluntary and involuntary. The great majority of this group are penniless, and few have experience in agriculture. As a consequence there is little opportunity for proper selection, and if successful settlement is at all possible, the agency attempting it will need an

even higher degree of organization and competence than that required for the settlement of agricultural migrants.

The three categories may be classified briefly as emigrants for work, migrants for settlement, and refugees for settlement. The problem of organization concerns only the second and third. While the primary interest of this report is in the latter, the former will be discussed because it is the nearest comparable undertaking that has been systematically studied by competent experts.⁴ As such it provides a practical basis for comparing the two operations, and serves better than anything else to indicate the organizational requirements of refugee settlement.

There are few instances of successful settlement of white migrants, especially in the tropics, and modern experiments in such areas as Africa and Australia frequently cited as successful are still inconclusive. In reviewing the fundamentals of the problem in 1938, the Technical Conference of Experts found that the success or even the possibility of migration for settlement depended

. . . on organisation, sometimes of a highly complex kind. Whereas the ordinary migrant worker has reached his goal when he has found employment in which he can earn his living, the immigrant settler must work for years, under some public or private settlement organisation providing for his various needs, before he can establish himself finally. If organisation of this kind is lacking or inadequate the migrant settler is doomed to failure even if the general economic condition of the countries of immigration improves rapidly, and despite the opportunities that most of them still seem to offer him.

This need for organisation has been recognised by the countries of emigration, where the whole problem, thrown into relief by the difficulties now being encountered in connection with the oversea migration of workers, is receiving ever-increasing attention. In the countries of immigration too, certain actions taken, and a number of signs of a more general nature, indicate a growing realisation of the fact that the immigration of settlers is chiefly a question of organisation. There is, of course, nothing new in this. The whole experience of immigration countries goes to prove that the direct introduction of immigrants for the purpose of settlement has never succeeded without proper organisa-

⁴ I.L.O., Series O (Migration) No. 7.

⁵ I.L.O., Series O (Migration) No. 7, p. 10.

The outstanding differences between migration for settlement and refugee settlement can be simply stated. The migrant as a rule has some capital and is only partly dependent; the refugee has no capital and is wholly dependent. The migrant for settlement on the land is usually experienced in agriculture, and the refugee, except by chance, is not. The migrant settler is a product of selection, but there is little opportunity for proper selection of refugee settlers.

Except for these major differences, the problems of settlement are fundamentally identical. But the differences are themselves so fundamental as to affect the operation materially. Whether they constitute an insurmountable barrier to successful settlement of the refugee has not been demonstrated and cannot be determined without further experiment and experience. However, certain conclusions are inescapable. The first is that if direct settlement of the migrant is a complex undertaking, refugee settlement is even more so. Secondly, if migration for settlement demands precise and comprehensive organization, the requirements of refugee settlement in this respect are even more exacting. Finally, if after years of experience with the problem, the organization of migrant settlement is "still far from adequate," it is quite apparent that to organize permanent and successful settlement of the refugee will demand infinitely more attention and study than has been or is being devoted to the subject.

There is no precedent for the comprehensive organization of an agency whose purpose would be the direct settlement and re-establishment in tropical areas of refugee European whites. The various repatriation movements, however successful, were by no means a similar operation. Others that are relatively comparable have been modeled more or less upon private institutions of a social character designed primarily for the direct settlement of migrants. In general the organizational framework of these institutions has been adopted with such improvised modification as seemed appropriate to allow for the major differences just discussed and thus to fit them to refugee operations. The result is not encouraging, for the adaptation rests upon a form of organization that, in expert opinion, is none too well suited even to the purpose for which it was originally designed.

Past experience in migrant settlement can undoubtedly contribute

a good deal to the organization of an effective agency for refugee settlement, but, incomplete in itself, it obviously does not provide an adequate structural basis for a dissimilar and more difficult undertaking. There are three types of organization dealing with migrant settlement: official agencies, commercial settlement companies, and private agencies of a social character.

Official agencies. As regards the first, administrative machinery of practically all immigration countries includes various bureaus and departments directly or indirectly interested in farm settlement. These interests embrace the sale or lease of public lands, crop and settlement service, and the extension of a wide variety of farm and crop credit. In a majority of cases services are unco-ordinated and finances limited. A number of South American countries have attempted co-ordination,⁹ with particular reference to immigrant settlement, by the creation of autonomous agencies, but such agencies are incomplete, essentially domestic affairs, and do not of themselves solve the matter of inadequate finance. While co-operation of autonomous units of this kind would prove of inestimable supplementary value to refugee settlement, they do not supply the organizational setup necessary either to initiate or to conduct a refugee operation. The existing units—organized chiefly to promote selective settlement—are not disposed to co-operate in the settlement of refugees, but in principle an autonomous official institution of this nature could be an effective adjunct of the refugee agency.

Commercial settlement companies. The record of commercial settlement companies is not good. With few exceptions such ventures are basically a speculation in real estate with profit primarily derived from the margin between the purchase and the sale price of land. Experience has repeatedly demonstrated that the interest of promoter and settler are seldom identical. Legitimate profits and satisfied settlers are a rare combination. But even if it were otherwise, the purely commercial form of settlement agency is ill adapted to refugee settlement, where settler impoverishment, inexperience, and high unit costs all but preclude the possibility of recovering a profit from land sales. In but one respect has this form of organization anything to contribute, and that is the funda-

⁹ Argentina, Brazil, Chile, Uruguay.

mental principle of commercial methods of operation as distinct from commercial motives. In its own and the settler's interest, the refugee agency might well adopt commercial management practice, especially in the field of operating economy, efficiency, and general restraint upon costs.

Private associations. The third type of existing organization for the settlement of migrants is the private association or institution "whose purpose is predominantly a social one—that of ensuring the successful settlement of the greatest possible number of their candidates."⁷ The Technical Conference of Experts divided this form of agency into two principal groups:

(a) Settlement organisations created exclusively for a social purpose, engaging in settlement activity for its own sake and not with a view to profit; financial interest in the work is limited at the most to the covering of expenses;

(b) Settlement organisations created for a social purpose but financed by private capital and thus obliged to earn profits from which to pay dividends; in these organisations the commercial motive of profit is more or less explicitly subordinated to the social purpose of settlement, it being recognised that maximum profits are not always compatible with a socially, demographically, and economically sound settlement policy.⁸

As refugee settlement has been inspired and financed very largely by public charity and private philanthropy, it is not at all surprising that this form of organization was adopted for the purpose. But the opinion of the Technical Conference was that the social type of organization, like the official services, is not sufficiently developed to perform the task for which it was originally designed; that the danger inherent in this form of agency is that it may "be founded by persons who lack the necessary experience and ability"; and that settlement associations of this type "are unsuitable as a means of promoting a new movement of migration for settlement."⁹ Although some effort has been made to fit the social organization to refugee needs, the conclusion of the experts is as valid for refugee as for migrant settlement. However, in principle the non-profit form of

⁷ I.L.O., Series O (Migration) No. 7, p. 12.

⁸ The same, pp. 15-16.

⁹ The same, pp. 16-17.

agency with the social purpose of successfully settling the largest possible number has much to offer as an organizational basis for refugee settlement. It meets two fundamental requirements in that successful settlement of the refugee cannot yield profit beyond perhaps a nominal return on a reasonable capital cost, and if the agency is to be at all effective it must not only re-establish a few fortunate refugees but the largest possible number of distressed people.

There are other factors of a more tangible nature that affect the form and type of settlement organization and which the organization must be designed to embrace. Only the more important can be mentioned here. Of these, the knotty problem of finance is pre-eminent, although such matters as the selection and acquisition of land, housing, water supply, sanitation, roads, agricultural preparation, and administration are equally vital to successful colonization once finance has been arranged.

III. FINANCE

To resettle and re-establish substantial numbers of impoverished people will require large sums of money. The prewar cost of settling 500,000 persons abroad was placed somewhere near 2 billion dollars, or almost \$4,000 per settler.¹⁰ Estimated per capita costs of settling limited numbers of refugees in the Argentine and in Rhodesia exceed this figure. Palestine costs range from \$2,500 to \$6,000 per settler. The Sosua project in the Dominican Republic contemplates a repayment by those settled there of \$1,600 per settler,¹¹ although actual costs to date are undoubtedly at a rate considerably in excess of that figure.¹² Estimates made just prior

¹⁰ Myron C. Taylor, vice-chairman of the Intergovernmental Committee on Political Refugees, in an address before the Council on Foreign Relations, New York City, Oct. 3, 1938. "Problem of Political Refugees," *Department of State Press Releases*, Vol. 19 (Oct. 8, 1938), p. 249.

¹¹ See director's statement to settlers, pp. 289-90, June 1, 1941.

¹² Total Sosua expenditures as of June 1941, according to round figures supplied by the settlement administration, were about \$650,000, including \$111,000 transportation costs paid by another agency. As of June 30, 1941 the roster of the Sosua colony was 234 men, 90 women, 28 children under 15 years of age, including 30 trainees, or a total of 352 persons. If the cost is prorated among the men, it would be close to \$3,000 per person. This is, of course, a very rough measure of unit cost, but it is one that tends to understate rather than overstate the actual cost. Cost of land, obtained by issue of \$100,000 of Dorsa stock, is not included in these figures.

to the war of numbers to be evacuated from Greater Germany alone, including re-evacuation of emigrants still in Europe or the ports, total about 500,000 persons.¹³ The amount thus involved spread over a period of time may reasonably total not less than 1 to 1½ billion dollars.¹⁴

Private funds. Private funds are and have been the principal source of refugee finance.¹⁵ If postwar conditions permit a resumption of European emigration in volume it seems highly probable that new sources, and perhaps new methods, of finance will have to be found. Three things are reasonably clear. The first is that private fortunes throughout the world are exposed to war taxes, the misadventures of war, and the jeopardy of a postwar deflation. The second is that resettlement of the distressed peoples of Europe involves sums that only government can provide. The third is that staggering costs of modern war threaten in varying degree the fiscal, monetary, and financial structures of government everywhere. In short, the financial organization of postwar refugee settlement may well be faced with an increased need for funds and the reduced capacity of either private or public agency to supply them.

Potentially there are other circumstances that may directly affect the methods of refugee finance after the war and under which, to be effective, financing would require an even higher degree of organization. Should the war divide the world into two broad groups, with the principal raw material consumers under jurisdic-

¹³ In August 1939 the estimated number to be evacuated from Germany was as follows:

Confessional Jews	209,000
Non-Aryan Christians	127,000
<hr/>	
Total	336,000
For re-evacuation from other European countries	140,000
From Shanghai	16,000
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Grand total	492,000

¹⁴ Based on 500,000 people at a unit cost of from \$2,000 to \$3,000 each.

¹⁵ Of the 500 million dollars invested in Palestine, it is claimed that 400 million represents private investments and 100 million private contributions. (*The New Palestine*, Jan. 24, 1941.) "I estimate that since 1933 the public all over the world have subscribed at least \$50,000,000 in cash and another \$25,000,000 in hospitality and other means of assistance." Sir Herbert Emerson in a statement of German refugee problems, 1939, distributed by the American Jewish Joint Distribution Committee, New York.

tion of a barter economy and with the producer nations adhering to a money economy, the difficulties of refugee finance would multiply. Should the world as a whole attempt to revive a money economy it will have to reconstruct the mechanisms of international credit and finance. In neither case is the postwar task of organizing refugee finance likely to be an enviable one.

Subsidiary finance. Another phase of finance that demands careful organization is the supply of risk capital for refugee enterprise other than direct settlement and subsistence on the land. Most refugees can be taught to produce some degree of subsistence, but only an undeterminable percentage will turn out to be successful farmers. Those that do not will either supplement income by wages, or engage in some sort of enterprise that promises a better return. The probabilities are that a refugee community will begin to divide at an early stage into farmers, wage earners, and entrepreneurs. The farmers will probably need credit facilities for the production of surplus or cash crops. Entrepreneurs will require both plant and working capital. The demand will be for both short- and medium-term loans, depending upon circumstances and the nature of the enterprise.

The question naturally arises as to whether supplementary risk capital should be supplied by the settlement agency or by some other agency. In both farming and new enterprise the risk can be high, especially in areas where the return and even land values are closely identified with the widely fluctuating fortunes of unstable export markets. The prime purpose of the settlement agency is to settle the largest number of refugees; and if resources are dispersed and perhaps jeopardized by risk loans, the number that can be settled will suffer accordingly. Unless initial settlement costs can be greatly reduced, the settlement agency will find itself substantially committed beyond the amount of what may be termed mortgage debt collectible from the settler. To increase this commitment further in the form of risk loans not only places an added strain upon settlement finance but requires the organization and maintenance of a highly competent administrative and supervising authority if defaults and losses are to be held to normal commercial levels. On the other hand, should the settlement agency refuse to

lend risk capital, some other agency must be created for the purpose. This of course would involve a clear definition of the scope and status of third party loans, and adequate protection of the settler against extortionate terms.

The idea of an independent, third-party lending agency appears to offer attractive possibilities wholly aside from the short- and medium-term loans referred to above. Properly organized and operated, such an institution might prove a very effective means of lightening the financial burden on the settlement agency by discounting or by purchase, or by otherwise taking over mortgage loans of settlers. The League conference of technical experts studied this phase of the problem as it applied to migrants:

The procedure is simple. When the settler has paid off a sufficient proportion of his debt to justify the assumption that he will have no difficulty in paying off the rest, the bank, in agreement with the settlement organisation, grants him a mortgage loan equal in amount to the debt outstanding. The loan is secured on the settler's land, the title deed of which is handed over to him on this occasion. He can thus pay off the remainder of his debt to the [settlement] organisation, which thereby reduces by several years the term of its investments. Having thus recovered its funds, it can use them to establish new settlers.¹⁶

Even if independent financing of small enterprise should prove undesirable, the probabilities are that it would be necessary in the case of long-term loans to larger industry. Should the opportunity arise for the establishment of an industry to employ substantial numbers of people, either adjacent to or at a distance from the refugee settlement, new problems of both finance and settlement policy would arise. Few industries can be established and equipped today for much less than \$1,000 per worker employed. In addition, the worker would either have to be housed by the operating company or financed for housing and house furnishings. For refugee settlement the ideal would seem to be the establishment of a factory center complete with garden cottages for employees. But to provide any volume of employment would involve the investment of a large amount of money for a long period of time. Like the other problems of subsidiary finance, the question arises here as

¹⁶ I.L.O., Series O (Migration) No. 7, pp. 64-65.

to whether the settlement agency or some third-party institution is the proper medium for organization and supervision and for the supply of funds.

IV. SELECTION AND ACQUISITION OF LAND

Little or no unoccupied land suitable for mass settlement is available in the temperate zones. There are areas of low density of population, but all such areas lie within countries which exercise immigration control of one sort or another. Within the North Temperate zone no redistribution of population is politically feasible which would relieve the congestion of Europe and East Asia.¹⁷ In the South Temperate zone there is relatively little land and in such as there is—southern Australia, Union of South Africa, and the southern band of South American states—immigration is strictly regulated.

The choice of areas for large-scale colonization is consequently limited to tropical and semitropical lands lying roughly between 23 degrees north and 23 degrees south latitude.¹⁸ Choice is further limited by the fact that the eastern area of this zone is also highly congested.¹⁹ The choice is, therefore, further narrowed to the less populated tropical and semitropical lands and islands of Africa and the Western Hemisphere, and ultimately to a few areas within the belt where climate, soil, and political and racial conditions are reasonably conducive to the settlement of northern whites.

Land is available in this area not because there is no restriction upon immigration, but because there are, or are believed to be, undeveloped or under-developed areas in control of governments

¹⁷ The congestion is in Europe, China, and Japan, including Manchukuo. Areas of relatively low density are principally the U.S.S.R., Canada, and the United States, all of which impose, and are politically able to enforce, immigration restriction. Racial problems present an added obstacle to redistribution.

¹⁸ As Price points out, the mathematical definition of 23½ degrees north and south latitude is no true delineation of the tropics. "In certain areas highlands, cool winds, and cold ocean currents carry temperate conditions far into the tropics, while in other areas lowlands, hot winds, and warm ocean currents carry tropical conditions far beyond the mathematical limits." Price accepts the Miller and Huntington definition of tropics as the annual isotherm of 70 degrees Fahrenheit. A. Grenfell Price, *White Settlers in the Tropics* (1939), p. 4.

¹⁹ Congestion in the tropical Far East is primarily in Java with 818 per square mile, India with 196, and the Philippines with 143. *World Almanac*, 1942, pp. 271, 375.

willing to negotiate organized colonization. As already noted, the great bulk of the tropical land is unsuited to settlement by northern whites, but there are nevertheless certain promising areas. In recent years preliminary studies have been made of several.²⁰ However, recent experiments in colonization clearly indicate the need for more study and more careful selection of settlement lands. Climate, soil, rainfall distribution, water supply, and drainage are all equal governing factors. None can be safely ignored without some jeopardy to health or economic progress. Political, racial, and social environment are likewise factors of importance, for they directly influence the well-being and development of the colonist. Finally, in the selection of land primarily for agricultural purposes, a balanced relationship between field crop, tree crop, pasture, and woodland is essential to effective utilization of the area to be purchased or otherwise acquired. The incidental acquisition of wasteland—unless it has definite recreational value or serves to protect the settlement against encroachment—only adds to the financial burden and to problems of administration.

The selection and acquisition of land for refugee settlement, therefore, requires a high degree of organization, preliminary study, and co-ordination of expert knowledge. The future of the colony will depend very largely upon the wisdom of its location. Land may be offered gratis by government, but there should be no hesitation in submitting the gift horse to just as careful and searching a scrutiny as would be exercised if purchase were intended.

V. HOUSING, WATER SUPPLY, SANITATION, AND ROADS

The inability or reluctance of early white settlers to adapt themselves to tropical environment was an outstanding cause of failure of many white settlements. It is only in recent years that the architect, engineer, and medical scientist have combined their knowledge and experience to overcome much of the ignorance and many of the prejudices that for four centuries exacted heavy toll of life, health, and comfort among whites in the tropics. Poverty still re-

²⁰ The President's Advisory Committee on Political Refugees directly or indirectly investigated settlement possibilities in Ecuador, British Guiana, the Dominican Republic, and Northern Rhodesia. Some study of similar possibilities in Mindanao has been made by the Philippine government, all since 1937.

mains the great barrier to improvement in the general condition of native populations. But the European refugee is likewise impoverished and in addition will bring with him customs and habits ill adapted to tropical life. If his health is to be guarded and if he is to be established on a level approaching that to which he aspires, scientific and technological experience must be organized, adequately financed, and applied to that end. To ignore the rudimentary precautions this experience dictates is to court a repetition of early failures.

American architects and engineers are leaders in the field of tropical housing. Price reports that some of the best housing in the tropics is that of the American whites in Panama. "Judged by this standard the white housing in tropical Australia, in Florida, and in Rhodesia is poor, and that in Costa Rica, Cuba, Puerto Rico, or St. Thomas scandalous."²¹ The West India Royal Commission, which investigated conditions in British possessions and crown colonies of the Caribbean, apparently found bad housing prevalent throughout the British area. After an exhaustive inquiry into social and economic conditions in Barbados, British Guiana, British Honduras, Jamaica, Trinidad, and Tobago, and the Leeward and Windward Islands in 1938 and 1939, which included visits to Cuba, Haiti, Puerto Rico, the Virgin Islands (U.S.), Saba, Guadeloupe, and Martinique, the Commission included in its recommendations a large housing program.²² In particular the Commission recommended that "powers should be taken to control the siting of new housing . . . with regard to considerations of health, sanitation and water-supply," and provided for "an expert to organise enquiry into methods of building and types of houses."²³

These are precisely the conditions that should govern the organization of any modern settlement. However, white colonies still lag in this respect. Too few houses are designed on really tropical

²¹ *White Settlers in the Tropics*, p. 224.

²² The report of this commission was withheld from publication, but at the suggestion of the Secretary of State for the Colonies, Mr. Malcolm McDonald, the Commission prepared a statement of recommendations. These were issued by His Majesty's Stationery Office in 1940 as Command Paper 6174, *West India Royal Commission, 1938-39, Recommendations*.

²³ The same, p. 14.

lines. Many have insufficient ventilation, no ceiling between galvanized iron roof and rooms beneath, no screening against mosquitoes and flies, and little effort is made to take advantage of the prevailing winds. The corrugated iron used extensively for roofs in the tropics is a ready conductor of heat, but this is not its only bad feature. In hurricane zones, almost the first thing to break loose is the "tin" roof, and there is no more dangerous projectile than a flying sheet of corrugated iron in a hurricane wind. While administrative sojourners have readily adopted for their own occupation well-situated, wide veranda, open-room types of modern tropical housing, the practice does not generally extend to the housing of permanent settlers. Durability is another feature that is generally ignored, especially in areas where insect and wind damage is prevalent. There is much to do in the organization of refugee housing.

Though it should hardly seem necessary in this day and age to point out the vital importance of pure water supply and sanitation in the prevention of disease and maintenance of community health, these fundamental precautions are not always observed. Clearly, if refugee settlement is to be organized successfully, it must provide for the co-ordination and application of all that experience and modern science can offer in this field.

The most likely locations for refugee settlement are the unsettled or sparsely settled areas. Of their very nature these areas have few serviceable roads. Next to proper housing and sanitation, an all-weather road system is essential to the permanent life and progress of a community. In the organization of refugee settlement this factor will have to be taken into serious account. Attempts at colonization in various areas have failed largely because of isolation and lack of communication.

It is not enough that proper housing, sanitation, water supply, and a road system be organized and incorporated in the general settlement project, but a good part of these facilities must be installed and in place prior to arrival of the refugee. The central and north European refugee is not a pioneer in the sense that he is capable of enduring tropical hardship while creating these things for himself. In the mass, refugees consist of urban dwellers, trades-

men, shop and factory workers. Few are carpenters, masons, blacksmiths, or even outdoor common laborers. Few of the current flow are farmers or farm laborers. Suddenly to project a substantial number of people inured only to urban life into a tropical agricultural environment without prepared housing, sanitation, water supply, and serviceable roads is an invitation to tragic failure.

VI. AGRICULTURAL PREPARATION

Refugee settlement primarily contemplates the establishment of agricultural communities. Although few emigrants are farmers or have had agricultural experience, the selection of this mode of life is dictated by circumstances. On the one hand areas available for large-scale settlement are agricultural and all resources and production stem from agriculture. On the other hand, an agricultural economy is the only means potentially capable of lifting large numbers of impoverished people from total dependence to some degree of self-support within the time and financial limits imposed.

The choice of agriculture in turn imposes conditions with which organization must deal. It will have to provide for an appropriate form of agriculture, a suitable crop system, the acquisition of livestock and equipment, the initial preparation and cropping of the land, and for the agricultural training and supervision of settlers. As in the case of housing, water supply, sanitation, and roads, there are vital reasons why much of the subsistence cropping will have to be prepared in advance of the arrival of settlers. Once settlers arrive they must be fed and provisioned. Native production in all the most likely areas of settlement is, on balance, deficient in foodstuffs for the existing population. To draw on part of this for settler consumption will only serve to increase the deficiency. To import foodstuffs will add to the financial burden as will likewise any unnecessary delay in getting the settlement on a self-sustaining basis. And so long as settlement is in process, food production and supply must continue to anticipate the arrival of new settlers. From every standpoint, therefore, a high degree of agricultural organization and substantial agricultural preparation in advance of settler occupation are requisite factors of refugee colonization.

VII. ADMINISTRATION

Administration is as much a part of the organization problem as the thing to be administered. However well conceived and otherwise well organized a project may be, capable and experienced supervision is essential to successful fulfillment. Few undertakings embrace a greater range of administrative requirements than the task of transporting and permanently resettling the distressed peoples of Europe. To design and co-ordinate the functioning mechanisms will call for a high order of organizing genius, and the successful operation of these mechanisms will require a wide variety of expert administrative talent.

To say that this is no task for the inexperienced is not to disparage the effort of those primarily concerned with refugee settlement at the present time, but merely to state a very obvious fact. High purpose, beneficent intention, and unselfish labor are no substitute for the experienced direction and technical supervision that every phase of such an operation requires. The undertaking embraces a series of interlocking problems ranging all the way from statecraft to small farming. In its own way the latter is fully as technical a task as the former, and practical knowledge and experience are essential to the conduct of both. But knowledge and experience of the one is no qualification for the other, nor for the multitude of intervening operations involving finance, land acquisition and utilization, housing, sanitation, water supply, communication, health, and general welfare of the settlement. The philanthropist and the humanitarian can inspire and in part finance the project and influence opinion, but it is not to be expected that of themselves, either as a group or as individuals, they embody the particular experience and specialized talent essential to the effective organization, administration, and operation of so comprehensive an undertaking as refugee settlement.

Except that they dealt primarily with the condition of an existing population rather than the settlement of newcomers, and except that emphasis was more social than economic, the recommendations of the West India Royal Commission cover several phases of the settlement problem. The recommendations revolve around an annual grant from the Imperial Exchequer to finance

health service, housing, land settlement, and other social improvement.²⁴ Of interest here is the fact that the initial recommendation dealt with organization and administration. A special organization to administer the fund was recommended, to work out with the aid of experts long-term programs and to supervise the administration of grants. The Commission recorded its belief that "true economy will best be served by choosing a capable and experienced administrator for the post of Comptroller and giving him wide power to settle points of detail without reference." It was anticipated that the composition of the expert staff would vary from time to time, but the Commission expected it to include experts on finance, health, housing, taxation, labor and social welfare, education, a civil engineer, and a statistician. In short, the Royal Commission foresaw the organizational need for a "capable and experienced" director, and the administrative need for an expert staff on the ground covering every phase of contemplated operation.

If large-scale refugee settlement in the tropics is to succeed it must incorporate some such organizational procedure. As directing head it will undoubtedly require the services of a man of great competence, preferably one who has had tropical experience in colonial government, the development of resources, or the construction of works, but, in any case, a man of proved executive capacity in the practical administration of large undertakings involving the care and direction of large numbers of people. To command the confidence and respect of governments with which he must deal, the director general of refugee settlement should be a man of national or international repute. And within defined limits of policy he must be granted broad powers, wide administrative authority, and complete discretion in the selection of his advisory

²⁴ "There is a pressing need for large expenditure on social services and development which not even the least poor of the West Indian Colonies can hope to undertake from their own resources. We therefore recommend the establishment for this purpose of a West Indian Welfare Fund to be financed by an annual grant of £1,000,000 from the Imperial Exchequer for a period of 20 years, and of a special organisation to administer this fund under the charge of a Comptroller. The objects of the Fund should be to finance schemes for the general improvement of education, the health services, housing and slum clearance, the creation of labour departments, the provision of social welfare facilities, and land settlement, apart from the cost of purchase of land." *West India Royal Commission, 1938-39, Recommendations*, p. 9.

board and expert staff. With the settlement agency thus organized around eminent leadership and under competent administrative direction, the highly technical task of establishing and administering the settlement colony could then be delegated to an operating field unit composed solely of appropriate technicians and experts.

The foregoing review of refugee settlement organization is of necessity but a brief summary of some of its essential elements. Each major element has many facets, and there are still other aspects of the subject that organization will have to embrace. In magnitude, complexity, and scope there are few organizational problems that rival this matter of successfully re-establishing large numbers of impoverished people in a strange environment and new mode of life. Few operations demand as searching investigation and thoughtful study. In contrast to the extensive investigation into conditions governing the movement of migrant workers and the organization of migrant settlement by the League of Nations and its subsidiaries, relatively little has been done in the more difficult field of refugee settlement. Several phases of the latter have been attacked from time to time under pressure of emergency by the League itself, by official and semi-official agencies of both emigration and immigration countries, and by private associations of a social and philanthropic character. When the war intervened, an intergovernmental committee representing 32 nations was wrestling with intergovernmental phases of the problem, but only as it related to political refugees of Greater Germany.

All these are merely fragmentary parts of a whole. So far as is known, "the statesman, philanthropist, economist, historian, geographer, engineer, and medical scientist," upon whose co-operative effort white settlement in the tropics depends for success, have never been brought together for a comprehensive survey and systematic study of the problem and its organization. In all probability a conference of this nature will have to await the outcome of the war, but there is a vast amount of preparatory work that must be done, and which can be undertaken while the war is still on. If the Intergovernmental Committee can broaden the scope of its mandate, it might usefully assemble a committee of experts

representing every element of such a conference, for preliminary study and report similar to that rendered by the Conference of Technical Experts on migrant settlement in 1938. Without some such preparation there is little prospect of creating a comprehensive organization for the permanent settlement of existing refugees or their postwar counterparts.

CHAPTER III

ECONOMIC AND OTHER FACTORS AFFECTING REFUGEE SETTLEMENT

There are a multitude of factors that affect the relocation and settlement of large numbers of people. Some have already been touched upon. The economics of the operation essentially begin with the impoverishment of the refugee, for impoverishment conditions every phase of settlement both from the organizational and from the operating point of view. Impoverishment of the European emigrant is not alone a product of political persecution, but arises as well from a variety of economic conditions, many of which may be aggravated rather than relieved by the present war.

I. FINANCIAL ASPECTS OF SETTLEMENT

A comparatively small number of actual or potential refugees were penniless in their country of origin. In 1938 the Vice-Chairman of the Intergovernmental Committee on Political Refugees said: "Very few of these emigrants were objects of charity or in need of it under normal conditions. Nearly all of them were self-supporting, a number of them were wealthy."¹ He quoted the estimated value of refugee wealth in Germany alone at from 2 to 6 billion dollars. Whatever the political circumstances opposing the owner's right to export his own wealth, the ability to transfer it was and will continue to be basically economic.

This problem of transfer has its roots in the disparities created by the last war, the dislocation of international trade, and the unbalance of international payments. For the transferring country, remittance of emigrant assets is a payment abroad, and to be able to remit requires the export of something of comparable value.²

¹ Myron C. Taylor, "Problem of Political Refugees," *Department of State Press Releases*, Vol. 19 (Oct. 8, 1938), p. 249.

² " . . . It is not sufficient that would-be emigrants should have the necessary funds or that some national institution should help to raise the necessary funds by selling their property on satisfactory terms. The countries in question must also have enough foreign currency to place at the disposal of emigrants for transfer purposes without fear of undue harm to various branches of the economic

Transfer difficulties have arisen because such exports have not been forthcoming in sufficient volume, especially to countries of emigrant destination. In effect, the foreign boycott against purchase of German goods has merely served to impair German ability to transfer emigrant assets. But the difficulty of remitting such funds was not confined to Germany. In 1935 Poland was called upon to transfer 40 to 50 million zlotys¹ for the account of Polish emigration to Palestine, and this movement of capital abroad was one reason assigned for the introduction of foreign exchange regulation.⁴

It seems safe to assume that war will improve neither existing emigrant assets nor the facilities for their transfer. Few central European savings long survived the last war, and fewer still over a much wider area are likely to survive the present conflict. Nor is there any reason to expect an immediate postwar restoration of international commercial and financial relations such as would recreate effective facilities and machinery of transfer. Irrespective of political policy, it therefore seems probable that impoverishment of the emigrant will remain the primary economic fact of European postwar emigration. This is of paramount importance, for, given access to such means of their own as can be salvaged and facilities for transfer, many more emigrants can be settled by individual than by organized effort.

Emigrant settlement under such circumstances cannot help but give rise to intricate problems of an economic and financial nature for non-European countries, especially those of the Western Hemisphere. To shift large numbers from a state of self-support or partial dependence in countries of origin to a state of total dependence in countries of destination is to burden the latter with their care and support until such time as the impoverished emigrant is again able to sustain himself and family. Economically, the matter of refugee settlement resolves itself on the one hand

system." International Labour Office, *Technical and Financial International Co-operation with Regard to Migration for Settlement*, Report of Technical Conference of Experts, Series O (Migration) No. 7 (1938), pp. 82-83.

³ Equivalent to from 7.5 to 9.5 million dollars at 1935 average rate of exchange. (Federal Reserve Board, average of noon buying rates for cable transfers in New York, 18.882 cents per zloty.)

⁴ I.L.O., Series O (Migration) No. 7, p. 60.

into devising the speediest means of restoring the settler to self-subsistence and, on the other, into finding the necessary capital to finance him in the interim.

If the settler has no capital of his own there are but two sources of settlement finance—the grant or loan of public funds, or the gift or loan of private funds. It is not unusual for immigration countries to provide some form of financial assistance to independent settlers, but there are few instances of intergovernmental co-operation, or large-scale unilateral assistance by government, in the finance of group settlement. Since the last war, where the will to aid exists at all, the problem of transfer has tended to limit assistance by emigration countries to services and expenditure payable in the domestic currency, such as transportation on national railway and steamship lines, or to barter credits. On the other hand, financial aid for group settlement by the immigration countries has been mainly confined to those settlers who meet the selective requirements imposed by the receiving government. In short, the mobilization of public funds for emigrant settlement is largely conditioned by the conflicting economic circumstances and policies of governments concerned. Countries of emigrant origin either cannot or will not contribute to any great extent, and several refuse to permit conversion and transfer of emigrant property. Countries of emigrant destination are either unwilling or financially unable to contribute, and universally reject destitute immigrants unless their support is fully guaranteed. The only remaining source of public funds would be governments not directly involved in the transaction. Unless it can be demonstrated that the financing of refugee settlement in other than their own domain is of primary national interest, the prospects of financial contribution by third-party states is not good.

While private philanthropy has contributed liberally in aiding the emigration of distressed peoples, private resources are too limited to finance the settlement of large numbers of impoverished people.⁵ The dilemma of large-scale settlement is that private

⁵ In a speech circulated by the American Jewish Joint Distribution Committee in 1939, Sir Herbert Emerson, director of the Intergovernmental Committee on Political Refugees, placed total private contributions between 1933 and 1939 at 50 million dollars in cash and 25 million in hospitality and other means of

philanthropy is willing in principle but financially weak, while government, the only organization financially able to perform the task, is unwilling in fact to undertake it. If refugee settlement lent itself to sound commercial operation, private capital might conceivably be found to finance it. But it cannot be organized or operated on purely commercial lines. Commercially such an enterprise would be primarily a real estate operation in which the operating corporation would derive its profit from land sales to be paid for by the settler over a period of years.⁶ The refugee is not only unable to make an initial payment⁷ but would have to be financed in addition for housing, equipment, and maintenance. Liquidation of the loan over a short period such as would satisfy dividend requirements would prove burdensome to the settler and risk a high percentage of default. Repayment over a long period with the attendant tie-up of capital would prove unattractive to the investor.⁸ From both the settler and the investor points of view, the record of commercial settlement over a long period of years is highly unsatisfactory. But even if the record were good and refugee settlement lent itself to commercial finance, there is little risk capital today willing to venture on overseas enterprise of this nature.

With present and prospective limits upon the supply of capital, the complementary economic factor affecting settlement of the

assistance. On the basis of costs as estimated by the vice-chairman of the latter committee, the whole amount would have financed settlement of but 20,000 people, or only about 4 per cent of the estimated number to be evacuated from Greater Germany and emigration ports just prior to the war.

⁶ "The private settlement undertaking draws its profit chiefly from the margin between the price at which it buys land and the price at which it sells it again to the settlers." I.L.O., Series O (Migration) No. 7, p. 20.

⁷ In a commercial undertaking, initial payment is usually about 25 per cent of the total cost of the land.

⁸ "In the central region of Argentina for instance, it is generally admitted that the settler needs some thirty years, even if he brings his own working capital with him, to pay the price of his land. The National Mortgage Bank loans are made for a term of 33 years, and even so a large proportion of the settlers established on the land by means of these loans have been unable to meet their interest and redemption charges. The recently founded autonomous Settlement Institute of the Province of Buenos Aires charges interest at 3 per cent and redemption also at 3 per cent; the official Settlement Service of Uruguay grants the same conditions as the Argentine National Mortgage Bank; the loans of the Chilean Land Settlement Fund are made for a term of 41 years." I.L.O., Series O (Migration) No. 7, p. 25.

maximum number of refugees is the unit cost of settlement. Estimates of these costs are formidable, and experience tends to bear out the estimates.⁹ In recent years large amounts have been spent by governments and by philanthropic organizations in collecting refugees at ports of embarkation and maintaining them in countries of transit. It may be assumed, however, that these were extraordinary and unusual charges. The principal items of cost chargeable to the settler are transportation, cost of land and buildings, cost of maintenance, cost of equipment, and the supply of some working capital. In addition there are property improvement and maintenance costs covering roads, drainage, general sanitation, and water supply, which, unless written into land values, must be borne by the settlement organization. Finally there are the overhead costs of supervision and operation, some chargeable to the settler and others not.

There is a striking contrast between the estimated costs of refugee settlement and the average prewar cost of individual settlement for a Polish family in the Argentine. Whereas the former ranges from \$3,000 to \$4,000, the latter was about \$1,000.¹⁰ The two operations are not comparable as a whole, but some of the items are. The Polish settler landed with a little capital after paying transportation. He was locating in or near an established rural community in a temperate to subtropical climate. He was settling in an area where good ground water is available as a rule for the digging of a well. Little or no chargeable overhead was involved in locating him. He was probably experienced in agriculture and he was on his own. But conceding all the major differences, the fact remains that, like the refugee, the individual settler initially borrows money to house and feed himself and family, buy and prepare land, and equip himself to operate it. In the process he acquires a debt of from \$500 to \$800, whereas the refugee finds himself saddled with several times this amount. The former is

⁹ On the basis of total expenditures to June 1941 prorated among male settlers, unit costs at Sosua run about \$3,000.

A unit cost of from \$3,500 to \$4,000 per person settled has been estimated on the basis of figures given by Myron C. Taylor, *Department of State Press Releases*, Vol. 19 (Oct. 8, 1938), p. 249.

¹⁰ See table on p. 37.

experienced in agriculture; the latter is not. If forced to compete with each other, there is little doubt as to which would survive. In competition with cheap native labor there is no question as to which holds the advantage.

Mass refugee settlement is clearly a more expensive operation than individual settlement, even where the latter is organized and recruited. The question therefore arises whether mass settlement can be that much more costly and still hold out hopes of success

AVERAGE COST OF SETTLEMENT FOR A POLISH FAMILY IN THE
TERRITORY OF MISIONES, ARGENTINA^a

Item of Expense	Swiss Francs	U. S. Dollars ^b	Percentage of Total Cost
Transportation (2 adults, 2 children) . .	1,830	420.90	41.0
Land purchase (20 hectares) ^c	1,200	276.00	27.0
Clearing land (1½ hectares)	135	31.05	3.7
Implements and tools	135	31.05	3.7
Materials for building house	480	110.40	10.6
Maintenance until first harvest; seed . .	720	165.60	15.0
Total	4,500	1,035.00	100.0

^a From I. L. O., Series O (Migration), No. 7, p. 175. Taxes, consular visas, etc., are not included.

^b At the rate of 23 cents to the franc.

^c One hectare equals 2.471 acres.

either from the standpoint of financing a substantial migration, or the ultimate liquidation of debt incurred by the settler. The number of distressed persons that can be resettled depends simply upon the finances available and the unit cost of settlement. In the nature of the operation, there is a strong temptation to expand social costs and to over-price standards of living and desires as against standards of necessity. Such expenditure is of little service to the distressed in Europe if it curtails the number that can be evacuated, or to the beneficiary if it impairs his own ultimate ability to support it. Whatever the present inclination may be regarding the social aspects of refugee settlement, the determining factor in the long run will be economic. As the matter now stands, refugee settlement is an exceedingly costly operation, and the present dilemma is how to cut the expense and at the same time properly house the settler and provide those essentials which protect health

and promote the well-being of the settlement, such as water, sanitation, roads, and subsistence agriculture.

II. LAND PRICES AND LAND VALUES

Among the determining economic factors in refugee settlement is the matter of land prices and land value. The refugee is being projected into agriculture. Other reasons aside, the disparity between land prices and the economic value of land in temperate-zone agriculture would direct refugee settlement toward tropical areas where, with care and the control of debt, a safe margin can still be maintained between the cost of land and its productive value.

The real value of land is a capitalization of what it will yield, not what has been spent upon it in the process of acquisition, occupation, and cultivation. Refugee subsistence and development must essentially come from the land. The refugee can prosper only if it yields more than subsistence for himself and family, maintenance of structures, carrying charge on and amortization of debt. If it consistently yields less, the settler is doomed to failure.

In the United States, and to a lesser extent in other temperate-zone agricultural countries outside Europe, the margin between the price of agricultural land and its economic value has either disappeared or narrowed very materially. In the main this is due to a combination of land speculation, rising charges upon the land, and falling prices of farm produce. Farming is said to be unprofitable, and the state has everywhere intervened in one way or another to subsidize farm income. As a result the price of temperate-zone agricultural land is maintained at an artificially high level, and, for this and other reasons already mentioned, refugee settlement is diverted to the less developed tropical countries.

To some extent tropical agriculture, especially commercial and plantation agriculture, has suffered similar difficulty. There are, however, certain areas of undeveloped tropical and subtropical lands that economically and politically are open to refugee settlement. The land prices are low enough to permit refugee development provided two conditioning factors are observed. The first is that refugee agriculture avoids the already overcrowded field of

commercial and plantation production if it expects to prosper. The second is that the existing margin between the price of tropical land and its economic value should not be wiped out by excessive development costs and a scale of living the land cannot support. Economically the situation dictates great frugality in capital, operating, and living expenditure on the part of the settlement organization for settler account, and on the part of the settler himself. In a colony of this nature it will be extremely difficult to write development and improvement costs into a resale value of land, for there will be little or no resale market.

III. SPECIAL PROBLEMS IN THE TROPICS

If refugees are to be settled in the tropical countries, there are still other factors that will influence and in many cases govern the operation. The nature of tropical production and the capacity of domestic and foreign markets to consume tropical products will very largely determine the settlement economy. Primarily these countries are raw material producers, and the great bulk of production is agricultural. Output can be broadly classified as foodstuffs and industrial raw material. The latter embraces a variety of both agricultural and mineral products consumed by industry. A large proportion of the foodstuffs and practically all the industrial raw materials are consumed outside the countries of origin. In areas of prospective settlement, the manufacturing industry is small, serving principally the domestic needs. The factors that tend to keep it small are the absence of cheap power and presence of surplus industrial capacity elsewhere throughout the world.

Such is the general picture of tropical economy. The greatest volume of employment is supplied by agriculture. Mineral production, while high in value, provides a relatively small amount of employment. The same is true of domestic industry.¹¹ Moreover, the capital cost per worker in tropical industry is beyond the financial means of refugee settlement relative to the amount of em-

¹¹ In the Dominican Republic 1939 employment listed by industry totaled 35,744 workers. Of this number, 21,816 were really agricultural workers in the sugar industry. In other words, only 13,928, or about seven-eighths of 1 per cent of the total population, were employed directly in manufacturing industry.

ployment it would provide.¹² If, as assumed, the object is to settle the largest possible number, the only place substantial numbers can be employed in the tropics is in agriculture.

The tropical economy not only determines the occupation of the settler but largely dictates his agricultural program and the economic organization of the settlement colony as well. Within the borders of his own competence the settler can produce foodstuffs, or agricultural raw materials for industry, or a combination of these two. Subject to conditions, he can produce for his own and his community needs, for the non-community domestic market, or for the foreign market, or any combination of the three. But this is not a free option, for the settler's choice will be dictated by economic circumstances that cannot be ignored without penalty. In no case are the circumstances a fixed condition. But while all are variables over a period of time, those basic facts that govern the present and foreseeable future of refugee activity are reasonably clear.

The first is that all tropical countries open to large-scale settlement are poor. In most of them there is something more than a suspicion that native population is increasing faster than effective production. This feature will be subsequently discussed in greater detail. Food production in all, or practically all, the countries is deficient, and the diet suffers accordingly. There is unquestionably a potential need for additional food production which the refugee settler might satisfy. But in the attempt to do so he will immediately encounter two hard economic facts: (1) he will find himself in competition with exceedingly low native wage rates;¹³ and (2) domestic purchasing power is low. The second is not alone a product of the first, for taxation intervenes to divert to the state a substantial percentage of cash income that might otherwise be spent for food. From time to time this situation is relieved by a general rise in raw material prices, but that kind of relief is always temporary. Such relief as this war may provide in that

¹² The capital investment of Dominican industry, in 1939, was \$74,721,600, of which sugar accounted for \$61,461,000. Of the 35,744 industrial employees, 27,346 were employed in the sugar industry, or a capital investment per worker of about \$2,250 in sugar and about \$1,580 in "other" industry.

¹³ In the Dominican Republic native agricultural wages average 32 cents per day without board and 23 cents per day with board. See p. 224.

respect is almost certain to be canceled by postwar deflation. In the main, it is the native who must produce more, with less taxation by the state, if the settler is to find a profitable domestic market for selected produce.

Turning to foreign markets, the settler will find a similar situation in a somewhat different form. In Europe, the principal market, he will encounter increased domestic production of native foods, reduced consumption of foreign foodstuffs,¹⁴ declining purchasing power, and prospective postwar impoverishment on a vast scale. Added to this he will encounter the export subsidies of wealthier competing countries. In many products he can look forward to devastating competition of accumulated surpluses. An attempt to catch the war price for particular products will expose the settler to the high risk of subsequent loss, for war price deflation is rapid and the turn around of agriculture is slow. Finally, the market and price system on which the world has long relied for distribution—the most effective agency for this purpose so far devised—has been all but completely destroyed by the intervention of government. Under the circumstances there is little inducement for the refugee settler to produce for foreign consumption.

The remaining alternative is to produce directly for his own consumption and that of the settlement community. Such a course is dictated not alone by the uncertain prospect of these other outlets, but by equally persuasive reasons relating to refugee finance and the domestic economy of the country of location. Until the settlement colony is self-supporting, particularly in foodstuffs, it is a drain upon settlement finance and an already deficient native food supply. From every standpoint, therefore, existing and foreseeable circumstances dictate initial concentration of settler effort upon the production of individual and community needs. While it would be largely a subsistence economy, with little surplus for comforts or debt extinction, it would serve to restrict debt, provide a high degree of security, and form a sounder basis for future development than cash crop agriculture can possibly provide at this time.

¹⁴ The increase of European sugar production since the last war is a classic example of this trend. Wheat is another, although it does not directly affect tropical suppliers.

The white population has either declined or increased very little. The black, colored, and mixed-color population has increased with great rapidity and still continues to increase far beyond the white growth. But, whereas the high color density of both Barbados and Jamaica rests primarily upon heavy importation of negro slaves during the colonial period, that of the Dominican Republic—which imported relatively few slaves—derives largely from the Haitian military occupation and subsequent immigration of colored labor from neighboring countries and islands of the West Indies.²⁰ In the past 150 years, the white population of Barbados has fallen from 20 per cent of the combined white and colored to 8 per cent, and in Jamaica from 8 per cent to 1.75 per cent. But in the Dominican Republic the proportion of whites has declined from somewhere between 70 and 80 per cent in 1783 to 13 per cent in 1935.

Here is a rising tide of color that must inevitably engulf any but the most carefully prepared and protected white settlement. In many of the old communities “negroidation” of the whites is complete, and, with but few exceptions, miscegenation and absorption is gradually coloring such white groups as still remain in the Caribbean area. Modern colonization continues to ignore this aspect of the settlement problem. The first group of Sosua settlers was composed of 27 men and 10 women. Over a year later, with a total of some 324 adults in the colony, only 88 were white women, of whom all but 23 were married. Of the 20 marriages recorded, two were between native women and white settlers.²¹

VI. POPULATION PRESSURE IN THE CARIBBEAN

The population of the Caribbean islands is not only increasing rapidly, but there is considerable evidence that effective production of the area is not keeping pace with this increase. In other words, the indications are that per capita production available for the support of the people is decreasing; the people are becoming relatively and actually poorer; and standards of living for whites and colored alike are declining. The social unrest and disturbance of

²⁰ During the Haitian occupation of 1822-44, Dominican population increased from an estimated 63,000 in 1819 to between 80,000 and 100,000. *Anuario Estadístico*, 1937, Vol. 1, p. 85.

²¹ Based on figures supplied by the Sosua colony as of June 30, 1941. By the end of August there were four mixed marriages.

recent years in a number of islands is but a reflection of the squeeze thus applied by rising numbers in a static or faltering economy. It is regrettable that the text of the West India Royal Commission report was withheld from publication, for the report undoubtedly contained valuable data on this basic aspect of the problem. The recommendations of the Commission pointed out that "the rapid growth of population is indeed a factor of profound importance in the various economic and social problems of the West Indies, and it is vitally important that all sections of West Indian opinion should be fully aware of this fact."²²

The islands are densely populated. The British West Indies range from an average of about 175 persons per square mile for the entire group to 1,163 per square mile in the island of Barbados. The French islands of Guadeloupe and Martinique combined average 570. In Puerto Rico, there are approximately 500 per square

DENSITY OF POPULATION IN THE WEST INDIES^a

Area	Population per Square Mile	Acres per Inhabitant
British West Indies.....	175	3.7
Barbados.....	1,163	.55
Jamaica.....	264	2.4
Trinidad.....	250	2.6
French West Indies.....	570	1.1
Guadeloupe.....	522	1.2
Martinique.....	641	1.0
Puerto Rico.....	500	1.3
Haiti.....	300	2.1
Cuba.....	100	6.4
Dominican Republic.....	85	7.5

^a Official area figures have been applied to the latest available population count or estimate.

mile. Haiti now averages 300 or more, and the Dominican Republic about 85, or a total of 157 per square mile for the entire island. The population of Cuba is close to 100 persons per square mile of area. With the exception of Trinidad, which produces asphalt and oil, all these are purely agricultural countries in which a living must be wrested from the soil. Acreage per inhabitant may provide an even more vivid impression of population density than numbers per square mile. The table above shows both.

²² *West India Royal Commission, 1938-39, Recommendations*, Cmd. 6174, p. 18.

These figures may be compared with 17.5 acres per inhabitant in California and 23.9 in Florida.²¹

Except perhaps for Cuba and very limited areas elsewhere, the soil in none of the West Indies is rich. Most of the islands have been more or less intensely cultivated for over 200 years. As a general rule, the land must be systematically refertilized or suffer low and uncertain yields. Substantial areas have been completely abandoned to soil leaching and erosion. Most good crop lands have long since been consolidated into large holdings, notably the sugar estates. As a result little or no good arable virgin land remains, and the rising population is either forced back on soil-depleted areas for which it cannot afford artificial fertilizer, or up on the steep slopes where, under native cultivation, annual cropping is a precarious venture, where yields are low, and where top soils rapidly erode. Many of the islands are merely mountain peaks with more or less coastal plain, and others, like the Bahama group, are low-lying coral and sand reefs. In several of the islands, rainfall is either deficient or badly distributed.

A considerable percentage of the area is, therefore, unfit for the plow, and, although tree crops will thrive on some of the upland, the actual amount of land available for farming is much smaller per inhabitant than the table above indicates. In the Dominican Republic, where the total area now provides 7.5 acres per capita, only 2.0 acres per inhabitant can be classified as arable farmland, of which 1.5 acres per capita are now in crops and planted pasture.²² In Barbados there is only one-third of an acre of cultivated land per inhabitant, and in Trinidad only three-fourths of an acre. Some of the large holdings now in pasture or fallow unquestionably might be more productively operated. Some of the idle cane land can be diverted to food production. But while this would increase the area planted to food crops, it would add nothing to the present per capita total of farmland.

The fact is that there is very little additional crop land available in the West Indies for the rapidly rising population. In most of

²² Census Bureau, *Fifteenth Census of the United States: 1930*, Vol. 1, *Population*, p. 13.
²¹ Based on 1940 agricultural census.

the islands the native food supply is deficient, particularly in fats. The future of export crops is obscure, and unless domestic food production increases in some measure with the growth of population, the per capita supply of food will continue to decline. The West India Royal Commission made specific recommendations for relief of a situation that had already reached a critical stage in 1938.

In order to provide the means of absorbing this excessive growth of population it is essential on the one hand to secure an intensification of the agricultural system through a reorientation in the direction of mixed farming with far greater home production of essential foodstuffs, and on the other to take whatever steps are practicable to improve the position of the agricultural exporting industries.²⁵

Regarding settlement of more people on the land, the Commission said: "Mixed farming and not specialisation on export crops must be the basis of land settlement; this involves a change in outlook and methods, and in the habits and tastes of the consuming public and in commercial organisation."²⁶ And to this end the Commission recommended "that the order of procedure should be, first, the improvement of the husbandry of existing smallholders . . . then, the improvement of existing land settlements and the establishment of new settlements."²⁷

Unfortunately, there is no accurate measure of the trend of per capita food supply. Primarily the island supply has long been dependent upon a cash crop economy which revolved around the export of colonial products and the import of foodstuffs and manufactured necessities. Almost from the beginning food crops were subordinate to export crops. Since sugar-cane growing became important about the middle of the seventeenth century, island economy has leaned heavily upon sugar. This situation was not altered by the abolition of slavery, nor in recent years by the sharp increase in sugar production elsewhere throughout the world, or the increasing demand of a rapidly rising Caribbean population for food. Sugar still accounts for over 50 per cent of the value of Caribbean island exports, and foodstuffs continue to be a substantial item of

²⁵ *West India Royal Commission, 1938-39, Recommendations*, p. 18.

²⁶ The same, p. 23.

²⁷ The same.

importation. Instead of crop diversification to meet the growing demand for food, the picture is one of frantic increase in cash crops, notably sugar, and a diminishing return on the effort. In the areas of most rapid growth and greatest density of population—British West Indies, French West Indies, Puerto Rico, and the Island of Hispaniola—sugar production all but tripled between 1912 and 1938, while the base value of the output²⁸ increased less than 10 per cent.

The ten years just prior to the outbreak of war show the latest phase of the population squeeze. From 1929 to 1938 the combined population of Jamaica, Barbados, Trinidad, Dominican Republic, and Puerto Rico increased from around 4,458,000 to about 5,230,000, a growth of 772,000. Combined sugar production increased from 552 pounds per capita to 737 pounds. Taking the f.o.b. Cuba price as the base value of sugar for the entire area, the per capita value of total sugar production declined from \$10.00 in 1929 to \$7.37 in 1938. Per capita food imports decreased from \$7.63 to \$6.33. This decrease was general in all the countries except Puerto Rico, where a sharp increase took place. Prices, of course, fell during the same period, but not sufficiently to account for such a decrease in the value of imports. Without Puerto Rico, per capita food imports declined from \$3.52 in 1929 to \$1.39 in 1938. In short, while population increased 17.5 per cent and per capita production 33.5 per cent, the base value per capita of sugar produced declined 27 per cent. At the same time per capita food imports were down 17 per cent, including Puerto Rico, and 60.5 per cent excluding Puerto Rico.

In only one of the countries is there any evidence of important increase in domestic food supply such as might keep pace with rising population. Although early production figures are incomplete, the Dominican Republic substantially increased the output of certain domestic crops, notably rice, between 1929 and 1938. Dominican food imports during the period fell 75 per cent and directly with the value of sugar production, but in both value and volume the largest item of reduction was rice.²⁹ In terms of milled

²⁸ Computed on the f.o.b. Cuba price.

²⁹ Value of sugar went down \$4,973,000, value of food imports down \$4,959,000. Rice imports declined \$1,826,000 (21,100 metric tons).

rice, 1927-29 imports plus crop were equal to about 62 pounds per capita and by 1938 the crop alone supplied about 57 pounds per capita.³⁰ Consumption in this instance was all but fully maintained by an increase in domestic production. In volume, Dominican food imports as a whole declined 65 per cent between 1929 and 1938. Aside from rice, some of the decline can be traced to increased domestic production of other foods, but the displacement cannot be accurately measured.³¹ Elsewhere there is no evidence of any increase in basic food output comparable with that of the Dominican Republic. In Jamaica and Trinidad per capita food imports declined about 25 per cent, or about the same as the general reduction in the food price level. In Barbados per capita food imports were 15 per cent lower, while in Puerto Rico there was a 6.5 per cent increase.

The supporting evidence of this Caribbean food pinch is largely circumstantial but nevertheless impressive. There is every reason to believe it was primarily a diminishing ration that produced the social unrest, civil riots, and Royal Commission investigation during the middle and late thirties in the British West Indies. The Commission was of the opinion that a far greater home production of essential foodstuffs was necessary in order to provide the means of absorbing the excessive growth of population.³² The inference is obvious. The Dominican Republic increased domestic rice pro-

³⁰ Imports of milled rice for the three years 1927-29 averaged 63,904,000 pounds, which, with an average crop of 12,356,000 pounds, provided an average annual supply of 76,260,000 pounds, or some 62 pounds per capita for a mean population of around 1,225,000. In 1938 the domestic production of milled rice was 91,805,000 pounds, or 57 pounds per capita for around 1,616,000 people. In addition to this, some 14,746,000 pounds were imported for a total per capita supply of just under 66 pounds. However, the real benefit of increased cheap domestic production never reached the consumer. As imports and tariff revenues on rice fell off, the import tax was supplemented by an excise tax on rice milling. Consumption therefore remained under about equal tax restraint throughout the entire period. Production and trade figures from U. S. Department of Agriculture, *Foreign Crops and Markets*, Aug. 4, 1941, p. 122.

³¹ Though early production figures are lacking, there has been a recognized increase in domestic output of such foods as edible vegetable oil, milk, cheese, and alimentary paste. At the same time import of these articles has declined sharply, but whether the former fully offset the latter is not clear. The decline in imports of wheat flour, lard, canned meats, and fish is less likely to have been compensated by comparable increase in domestic production.

³² *West India Royal Commission, 1938-39, Recommendations*, p. 18.

duction, but the indications are that it had to tighten its belt on white flour and fats. Finally, as regards Puerto Rico, it seems evident that the meager ration there has been maintained by the increased import of food, and that the ability to import rests more upon generous relief grants from the United States than upon any basic adjustment in agriculture or general improvement in the economy of the island.

There is a grave question as to whether the future of the European refugee can be made secure by transfer from one area of population pressure to another, from an area of political pressure to an area of economic pressure, each equally ruthless. The Royal Commission just referred to found influences of a fundamental character operating to the disadvantage of the West Indies, "notably the rapid improvement of agricultural technique throughout the world, and the radical change that has taken place in the relation between the growth of population in tropical countries on the one hand, and in the industrial countries that represent their principal markets on the other."³³ Out of this has developed the economic monstrosity of high-cost, protected producers driving the low-cost, unprotected producer out of business.³⁴

In a very real sense the West Indian islands have a settlement problem of their own which has many of the characteristics and involves many of the difficulties of European refugee settlement. West Indian subjects for settlement on land are largely refugees of a one-crop industry, impoverished, and although inured to some form of agriculture, more accustomed to purchase food with wages than to grow it.³⁵ For a variety of reasons, some social, some economic, and others organizational, efforts to settle these people on the land have met with little success in either the British or American possessions, or in other islands. As in the sugar industry itself, the hope persists among the dependent peoples that somehow or

³³ The same

³⁴ The British, for example, built up cheap sugar production in their West Indies and then created a high-cost, protected industry at home.

³⁵ "Some feel that the peasant, having for several generations been accustomed to receiving his wages in the form of cash and maintenance from large land-owners, would prefer to continue to work for wages and purchase his food, rather than raise it himself." Arthur D. Gayel, Paul T. Homan, and E. K. James, *The Sugar Economy of Puerto Rico* (1938), p. 20.

other West Indian sugar production will come back into its own and again prosper. Periodic revival of sugar prices tends to sustain this hope, but in recent years the top of almost every recovery is below the previous peak. The war may cause some improvement in the price of tropical products, but if based solely upon war the recovery is likely to be temporary and the relief transitory. In the meantime, population is increasing rapidly, and even if the people were disposed to settle on small farms, the area available is limited. All in all, the West Indies as a permanent home for the European refugee have many serious and fundamental disadvantages to overcome which will demand a high degree of organization, preparation, and managerial ability.

PART II
ECONOMIC SURVEY OF THE DOMINICAN
REPUBLIC

CHAPTER IV

HISTORICAL SKETCH

Columbus discovered Hispaniola on December 5, 1492. Seven days later he took formal possession of the island in the name of the Catholic rulers of Spain, Ferdinand and Isabella, calling it La Española. Later in the same month, when the *Santa Maria* was wrecked, its timbers were used to build the first European edifice in the new world, and a number of men were left on the island at a fort christened La Navidad. In November 1493, when Columbus returned from Spain with an expedition of 1,300 men and several ships, he found La Navidad in ruins and no survivor of the garrison to tell the story of its destruction. Undeterred by this setback, he moved his base farther east to the mouth of the river Bajabonico and at this point founded the town of La Isabela early in December 1493. This survived some twenty years before it was abandoned for other better situated settlements.

I. THE COLONIAL PERIOD

Victory over the Indians in the Cibao in 1495 practically assured the domination of the island by the Spanish, although subsequent military encounters took place as late as 1520 when the Indian chief, Enriquillo, led a revolt in the southwest. Meanwhile, the Spanish soldiers went into all parts of the island setting up forts, which soon became towns and centers of mining or agricultural activity. In 1496, after gold deposits were found in the Jaina River, La Buena-ventura on that river and Nueva Isabela (later called Santo Domingo de Guzmán) on the east bank of the Ozama were founded as outposts on the southern coast.

The natives of the island were Arawaks, a relatively peaceable race, living from hunting, fishing, and primitive agriculture, and far less advanced than some of the Indians on the mainland. Estimates of the number of people at the time of Columbus' arrival have varied from a few thousand to 5 million. The latter figure is undoubtedly greatly exaggerated, but the reports of exploring parties

in the years 1493-95 would seem to indicate that there was a considerable aboriginal population. They disappeared rapidly after the coming of the Spanish, for besides those killed in battle, many died from smallpox and other European diseases. Hard labor in the mines and sugar fields and mills accounted for thousands more, though the "black legend" of the Spanish conquistadores' ruthless mistreatment and extermination of the native populations of the new world is no longer fully accepted by historians. By 1514 Las Casas, the "Protector of the Indians," estimated that only 14,000 aborigines remained. A second smallpox epidemic in the middle of the sixteenth century carried off those who were left, except for one very small group living in Boyá. Today none remain.

Spanish immigration to the new colony was narrowly restricted. At first only Castellians were admitted. Later other Spaniards were allowed to go to the Indies, but it was not until the latter part of the eighteenth century that any but Spanish subjects were allowed to settle, or even travel there. All Moslems, Jews, *marranos* (converted Jews) and *moriscos* (converted Moslems), and all persons with a taint of heresy in the preceding two generations of their families were likewise excluded. Exceptions were sometimes made, as when artisans and mechanics were recruited in Genoa and other Spanish-ruled areas and admitted under special license. Fifteen such came to Española in 1503.¹ No reliable estimates of the early Spanish population are available. There were said to have been 60,000 "souls" in the colony in 1517, just before an epidemic of smallpox reduced the population by one-fourth.²

With the extinction of the Indians, the problem of a labor supply became acute. Other Indians were imported from the Bahamas, but they too died off rapidly. Probably as early as 1500 the importation of African slaves began. The number was never very great because of the poverty of the colony, but the negroes soon formed a substantial proportion of the population. Three different racial groups had thus begun to mix their blood within a decade of the discovery.

The first settlers' interests centered chiefly in gold mining, but

¹ Americo Lugo, "Historia colonial de la Isla Española o de Santo Domingo," in *Clio*, año 8, No. 40, pp. 53-61.

² *Anuario Estadístico de la Republica Dominicana*, 1938, Vol. 1, p. 78.

agricultural and grazing enterprises were soon established. As early as 1505 and 1506 sugar was being made,³ although it was not until 1517 that any was exported to Spain. Columbus on his second voyage introduced cattle and horses, which multiplied rapidly, and by 1529 there were so many cattle on the island that their owners were freely permitted to kill them just for their hides.⁴ Supplying meat and horses for the many expeditions which left Española for other parts of the new world was a profitable business during the first half of the sixteenth century, and before the middle of the century the export of hides had become an important part of the colony's commerce.

The Spaniards also introduced some new plants, but even today most of the people depend largely upon indigenous plants, such as yuca, yams, and corn. At the time of discovery the natives were so much given to the cultivation of yuca that they were called "Yucayos" by the Spaniards. Native fruits, such as the pineapple, the avocado, and a host of others—the chirimoya, mango, mamón, guanábana, zapote, etc.—have provided variety in the diet of the natives of Española for an unknown number of centuries, and some, like the indigenous tobacco, have found an important place in the country's agriculture and exports.

Gold, sugar, and hides were supplemented by shipments of hardwoods and dyewoods; and forest products of medicinal value such as *cañafistula* and ginger also found a prominent place in the exports to Spain. Other native crops, such as cotton, indigo, and mallow, were used by the Spanish. The economic foundation established in the first generation of the colony was a reasonably sound one, as cattle-raising and agricultural development offered greater stability than mining alone could give.

Any sketch of the early years of Española would be incomplete if there were no mention of the activities of the Catholic church in the transference of European civilization to the new lands. On the second voyage of Columbus in 1493, Father Boil and twelve priests came to the colony. The conversion of the Indians and the supervi-

³ O. W. Bariett, *The Tropical Crops* (1928). See also, Lugo, cited above.

⁴ Luis E. Alemar, "Apuntes históricos sobre la introducción y cría de ganado en esta isla" [*Hispaniola*], *Revista de Agricultura*, December 1929, pp. 2-4.

sion of the morals of the Spanish at first were largely in the hands of the Franciscan friars. After 1510 Dominican friars arrived and later the members of the Order of Mercy. About 1530 a public school was organized by the bishop of Santo Domingo, Ramírez de Fuenleal. Española was the first European colony to have convents and also the first to have a bishopric. There are many illustrious religious men whose names figure prominently in the early history of the colony. Bartolomé de las Casas, of the Dominican order, was notable not only for his valiant defense of the Indians but as an historian of the early years of Spanish rule in the Indies,⁵ and one of its most severe critics.⁶

The first years were a period of great achievement and of great promise for the future. Prominent and powerful Spanish families were represented among the officials and settlers in the colony, and in every respect—architecture of the buildings, appearance of the streets, strength of the forts, and the general wealth and culture of its inhabitants—the city of Santo Domingo de Guzmán was truly a capital. Its early history,⁷ written by the great Gonzalo Fernández de Oviedo, shows it at its best.

After the discovery of Mexico and Peru, however, Española, like the other islands of the West Indies, was almost depopulated by the rush to share in the riches of the new mainland colonies. A royal order of 1526, forbidding emigration on pain of death, failed to check the exodus. By 1533 there were said to be only 50,000 inhabitants, and by 1564 only 30,000, of whom 500 lived in the city of Santo Domingo.⁸ The island was no longer the great center of Spanish power in America, and new catastrophes diminished its importance still further. In 1564 an earthquake destroyed the two cities that ranked after the capital in importance, Santiago de los Caballeros and Concepción de la Vega, and shortly afterwards a long series of raids by English sea-hawks and French and Dutch corsairs began. These sacked the coast towns and often penetrated inland, twice reaching Santiago.

⁵ *Historia de las Indias* and *Historia apologética de las Indias*.

⁶ *Brevísima relación de la destrucción de las Indias*

⁷ *Historia general y natural de las Indias*

⁸ *Anuario Estadístico*, 1937, Vol. 1, p. 78.

The colony suffered much from the inefficiency of the Spanish government, as well as from its short-sighted commercial policy.⁹ The action of Philip III, who ordered the destruction of Monte Cristi, Puerto Plata, and Bayajá (now Fort Liberté in Haiti), on the north coast of the island, in 1606, for trafficking with smugglers and pirates, was an example of drastic means to enforce the strict trading legislation.

In 1697 Spain formally recognized the dominion of France over the western third of the island by the Treaty of Ryswick, but it was 80 years before a frontier line was agreed upon. Not until 1737 was Puerto Plata re-established, following by a few years the restoration of Monte Cristi. With the advent of the Bourbon dynasty in 1700, the governors sent out were of somewhat better quality, but in the main the old vices persisted and the factor of remoteness diluted many good acts and intentions of the Crown before they were put into effect in the colony.

From time to time efforts were made to encourage emigration from Spain, and in 1683 and 1685 colonization by Canary Islanders helped populate some of the towns in the southern part of the island, especially Baní and Azua. Again in 1737, under Philip V, Canary Islanders populated the new towns of Samaná and Sábana de la Mar. These measures, however, did little to offset the losses due to disease, conflicts with the French and English, slave uprisings in French St. Domingue, and the migration to other more attractive regions. Later in the century the population apparently increased, and a church census in 1783 indicated that the colony had 117,300 inhabitants, including 14,000 slaves. Two years later another church census raised the figures to 152,640 and 30,000 slaves.¹⁰ Economic conditions began to improve after 1737. In the middle of the eighteenth century some of the prohibitions on trade with other American ports were relaxed. Coffee, introduced in 1737, gave the colony one more marketable crop.

Leland Jenks describes the economic and social conditions up to 1795 as follows:

⁹ Compare Lugo, *Glía*, año 8, No. 40.

¹⁰ *Anuario Estadístico*, 1938, Vol. 2, p. 78.

Nowhere was the plantation system more patriarchal or less capitalistic. Nowhere did the spirit of enterprise spread so slowly. . . . A handful of planter and mercantile families and some monastic foundations made up the bulk of the enterprisers. Tobacco, marketed in Hamburg, was the leading export crop, with coffee and sugar far behind. . . . But the rise of plantations perhaps encouraged a number of isolated towns with handicraft economy, local markets, building trades, petty centers for the activities of church and state and for the cultural life of the more well-to-do.¹¹

However, life in a cultural sense was probably no poorer in Santo Domingo than in Cuba, Puerto Rico, and much of the continent, with the notable exception of Mexico and Peru. The University of St. Thomas Aquinas in Santo Domingo had been authorized by Pope Paul III on October 26, 1538, and in 1540 a college (in 1583 it became the University of Santiago de la Paz), founded by Hernando de Gorjón, was also created. Both of these institutions of learning suffered the vicissitudes of the general decline of the colony, but for almost three centuries the University of St. Thomas attracted students from all the Antilles and the continental shores of the Caribbean. It played an important part in the life of the colony, and the College of Gorjón, which had been a university, then a seminary, and again (under Jesuit direction) a university until 1767, also contributed notably to the culture of Santo Domingo and to the Antilles as a whole.¹² The colony lacked such aids to education as the printing press (until the very end of the seventeenth century) and freedom of thought, for the Inquisition, with its Index of proscribed books, had limited the spread of new ideas, although it had not been able to keep them out of the Indies completely.

During the French Revolution, when Spain ceded Santo Domingo to France by the Treaty of Basil of 1795, the prosperity which had been developing steadily since 1737 was abruptly ended. It must be

¹¹ "The Development of the Dominican Republic," in *The Caribbean Area*, A. C. Wilgus, ed. (1934), p. 107.

¹² For a thoroughly documented account of the universities, see Finy Cipriano de Utierra, *Universidades de Santiago de la Paz y de Santo Tomás de Aquino y Seminario Conciliar de la Ciudad de Santo Domingo* (Santo Domingo, 1932). See also Pedro Henríquez Ureña, *La cultura y las letras coloniales de Santo Domingo* (Buenos Aires, 1936).

remembered that France in 1795 represented for most Europeans the horrors of unrestrained mob violence, of revolution against and destruction of all existing forms of government, religion, and society. Also the revolutions in Haiti and the massacre of the whites by their former negro slaves were examples close at hand of what French liberalism could do to a society. It is not strange that great numbers of the whites began to abandon the country. The exodus quickened when Toussaint L'Ouverture conquered the former Spanish colony in 1801, and many families left hurriedly with practically none of their property. As evidence of the number of refugees and the precipitateness of their flight there are records of arrivals of ships from Santo Domingo at Maracaibo, Venezuela, between January 20, 1801 and February 27, 1801. In this period of 38 days, at one port alone 1,653 people arrived in groups of 10 to 300—among them the last governor-general of Santo Domingo, Joaquín García and his family; 178 army officers and soldiers; 118 officials of the royal treasury office in Santo Domingo, including the treasurer, Juan de Lavastida; and 283 heads of families with their children, relatives, and slaves.¹³

French and Spanish rule, 1802-22. A French army under Napoleon's brother-in-law, Leclerc, reconquered the whole island in 1802, and French troops remained in the eastern end after a new black revolt drove the Emperor's forces out of Haiti. In 1808, however, Juan Sánchez Ramírez led a revolution against the French in the eastern end of the island. With the help of English ships and soldiers the movement was successful, and after a long siege of Santo Domingo city the French capitulated. General Sánchez took possession in the name of Spain on July 11, 1809.

When General Sánchez took over his post as the first governor of the restored colony, he found a poverty-stricken land inhabited by a handful of people who had been through a nightmare of fire and war and uncertainty and near starvation. The public treasury was empty, and there was practically no available revenue from customs receipts. Tobacco shipments from Puerto Plata to the United States and Europe, and some business in hides and honey and raw

¹³ *Libreta #12 Colección Lugo*, in Archivo Nacional de la Nación (Dominican Republic). Notes taken from Archive of the Indies, 79-1-25.

aguardiente, made in the few *ingenios* which had escaped being burned or wrecked, were the colony's only resources. The production of coffee and cacao was insignificant. Not a single mine was in operation and only a very little mahogany was being cut and sold abroad. Commerce was practically at a standstill. Near the gates to the capital one could see long lines of people buying plantains and other fruits and vegetables carried by one or two horses and guarded by a soldier, with sales apportioned by the judge of the district or by an officer of the government. Meat was fairly plentiful, but beef and pork had to come from the interior and were irregular in supply and poor in quality. There were scarcely a half-dozen carriages in the capital.

During the next few years conditions became even worse. Troops and government officials got half pay or no pay at all. An experimental issue of paper money in 1812-13 failed completely and further aggravated the economic situation. An attempt in 1813 by the captain-general, Don Carlos de Urrutia, to pay the troops in food which they were to sell for what they could get succeeded only in complicating matters and in earning him the name of Don Carlos *Conuco*.¹⁴ By 1821 the deputation which Santo Domingo sent to Spain reported that the decadence in agriculture and commerce in the island was so great that it was impossible to meet the costs of government. Government income was about \$120,000 and expenses were more than double that amount. The government owed about \$130,000 in back salaries to employees who had been dropped from the pay rolls.

Intellectual and social life, however, revived somewhat with the restoration of Spanish government. The University of St. Thomas, which had closed in 1801, reopened in 1815 as a lay institution. The press functioned freely after 1812, encouraged by the toleration granted in the new Spanish constitution. There was only scanty literary production, however, for this was an era given to political tracts, satires, and some purely personal *apologias* of men who had held office under the French and now wished to keep in the good

¹⁴ Del Monte y Tejada, *Historia de Santo Domingo*, Vol. 3, pp. 275-79. Del Monte y Tejada is quoting from the "Noticias" of a Dr. Francisco Morillas. A *conuco* is a small peasant garden.

graces of the Spanish. Newspapers and journals such as *El Duende*, *La Miscelánea*, and *El Telégrafo Constitucional de Santo Domingo* appeared in the latter years of this period, the last named coming in 1821.¹⁵ In 1820 the power of the church suffered a serious reverse when all the convents were closed. With the coming of the Haitians two years later, the renaissance of the intellectual life of the colony was abruptly ended.

Much of Spanish America had been in revolt since Napoleon had set up his brother, Joseph Bonaparte, as king of Spain. In Santo Domingo, however, the sentiment of loyalty was stronger, and it was not until 1821 that a move for independence was made. On December 1 of that year, the Auditor of War in the colonial government, Dr. José Núñez de Cáceres, almost single-handed declared the independence of the colony, naming it "The Independent State of Spanish Haiti." Simultaneously he applied to Simón Bolívar, the great liberator of northern South America, for the inclusion of the new state in Bolívar's republic of Gran Colombia.

II. THE HAITIAN OCCUPATION

The government which Núñez de Cáceres set up December 1, 1821 was scarcely organized before word was received from the president of Haiti, Jean-Pierre Boyer, that the government of the island was one and indivisible and that the Dominicans should acknowledge his authority or accept the consequences of an invasion by the Haitian army, which was preparing to march east. Confronted by this situation and convinced that a fight was hopeless, Núñez de Cáceres issued a manifesto on January 19, 1822 recommending to the Dominicans that they submit docilely to the Haitian army. The flag of Colombia was replaced by that of Haiti on January 21 without a conflict.

The occupation of the eastern part of the island by the Haitians proved to be of much longer duration than Dr. Núñez de Cáceres and his fellow Dominicans expected. An insurrectionary plot was harshly suppressed in 1824, and after this affair there was no overt separatist movement until 1844. Nevertheless, the desire for

¹⁵ Compare Manuel A. Amiana, *El periodismo en la República Dominicana* (Santo Domingo, 1933), pp. 11-15.

a separate government and for the maintenance of the Spanish language and traditions did not die. The inhabitants held meetings in their houses, and later in the Masonic lodges, although in the latter the rituals were conducted in French. The university was closed in 1823 for lack of students, all of whom had been obliged to enter military service in the Haitian army, and the Conciliar Seminary likewise closed its doors; but there still remained teachers, like P. Gaspar Hernández and Dr. Juan Vicente Moscoso, who gave their time and homes to keep alive some learning and affection for the refinements of life and intellectual pursuits. Occasionally anonymous verses appeared reciting the sad history of the years since 1821 and villifying the Haitian overlords.

In every respect, however, the social life of the country was at as low a level as in the poorest of the colonial periods. The influence of the Catholic church during the Haitian occupation was practically negligible. In 1822 all church property was sequestered and from 1830 to 1848 there was no archbishop in Santo Domingo. It was in this period that the Masons began to establish lodges in the leading cities of the eastern part of the island.

Production and commerce fared as badly as social and intellectual life. Just as the convents, the palaces of colonial days, and the colleges went to ruins, so did the few remaining sugar mills and other agricultural establishments that had survived the earlier Haitian invasions and the war of the reconquest. The loss by pillage and fire was further aggravated by the removal of the transportable wealth which many Dominicans carried with them in escaping to Puerto Rico or Cuba.

The former Spanish part of the island in 1822 must have had no more than 50,000 to 55,000 inhabitants, if a population figure for 1819 of 63,000 is reasonably accurate,¹⁰ for it is generally recorded that with the establishment of Haitian government all remaining Dominican families of any wealth left the country. To remedy in part this exodus and perhaps to help "Haitianize" the Spanish part of the island, President Boyer arranged for the immigration of 2,800 negroes from the United States. An American (Mr. Granville) was Boyer's agent in the United States for this

¹⁰ *Anuario Estadístico*, 1938, Vol. 1, p. 79.

plan. One thousand of these negroes were settled in and around Puerto Plata; 1,200 were sent to Santo Domingo City to be distributed in the South and East; 400 went to Jacmel to be settled in Neiba, San José de las Matas, Hinchá, and so forth; and the remaining 200 went to Samaná. According to José Gabriel García, "the great majority of these immigrants died of typhus fever or returned to the United States disgusted with the Haitian customs, the only ones acclimating themselves being those who went to Samaná, whose descendants form at the present day [about 1873] the greater part of the population of the peninsula."¹⁷ It is a fact that the descendants of these people are still to be found, and there is even an area known as the "distrito Americano," where English is spoken as the everyday language.

White immigration was inconceivable under Haitian rule, and few countries even had diplomatic or consular representatives in the country. Hence in this long period the composition of the population became proportionately more negroid. By 1838, when the Dominicans began their fight for independence, a great part of the population of perhaps 80,000 to 100,000¹⁸ people were wholly or partly of African descent. With considerable acquired resistance to disease and an ability to survive on a very low standard of living, the negroes had the essential attributes for survival in an impoverished area.

III. THE FIRST REPUBLIC, 1844-65

The movement for separation from Haiti had its beginnings with the establishment of the secret society La Trinitaria in Santo Domingo on July 16, 1838. This organization, initiated by Juan Pablo Duarte, and aided by Francisco del Rosario Sánchez and Ramón Mella, carried on agitation against President Boyer, who was encountering difficulties in Haiti. Finally in 1843 Boyer was overthrown and exiled, thereby ending 25 years of strong rule. On February 27, 1844, the independence of the former "Independent State of Spanish Haiti" was again declared, this time by a group of Dominicans assembled at night within the historic entrance to the city known as the Puerta del Conde.

¹⁷ *Compendio de la historia de Santo Domingo*, Vol. 2, p. 21.

¹⁸ *Anuario Estadístico*, 1938, Vol. 1, p. 79.

Immediately after the declaration of independence a governing committee was organized and plans were made for defense. The fear of a Haitian invasion was very quickly substantiated. Two expeditions left Haiti early in March 1844, one going by way of Santiago under General Pierrot, and the other, led by President Hérard, advancing through the south toward Santo Domingo. Both of these were defeated and the two victories were of inestimable value for the effect on morale in both countries.

In November 1844 a constitution for the republic was finally drafted after weeks of debate, and signed by the representatives meeting in San Cristóbal. By a *coup d'état* General Santana managed to have himself elected president of the Republic instead of Duarte, who had been the leading candidate. Throughout almost all of Santana's term until August 4, 1848, the Dominicans were obliged to fight for their security, draining still more the resources of man power and goods in the country. Again in 1849 under Soulouque, the Haitians initiated a campaign to recover their control over all of the island. This failed, but in retreating the Haitians burned four towns and laid waste the southern provinces from Azua west. Late in 1849 President Buenaventura Báez, who succeeded Santana, decided that the Dominicans should take the offensive, and a series of naval raids were carried out on Haitian ports. In 1851 a truce was agreed upon, but it was broken again in 1855 by a second invasion led by Soulouque, now Emperor Faustin I. This also was turned back, and the joint diplomatic intervention of England, France, and the United States restrained Soulouque from any further attempt at domination.

Meanwhile there had been much internal strife. Santana and Báez, the most influential leaders, at first worked together, but then quarrelled. Their rivalry, often breaking out into civil war, made it more difficult to resist the Haitians.

The weaknesses of the new state help to explain the frequency of revolutions and the confusion in leadership. To begin with, the population was very small. The estimate of 80,000 to 100,000¹⁹ in-

¹⁹ A church census of 1863 showed 207,700. *Anuario Estadístico*, 1938, Vol. 1, p. 79.

habitants in 1844 is perhaps too low, but the population between 1844 and 1861 was probably little more than 150,000. Moreover, many of the wealthier and better educated families had left the country. Since 1822 there had been practically no opportunity for education for the generation that was to manage political affairs from 1844 to 1861. Men like Duarte and Báez, who had been educated in Europe, were notable exceptions. Economic backwardness further aggravated the problems of government.

The state of affairs in 1857 will serve as an example of what conditions were like during this period of internal strife and sporadic battles against the Haitians. The message of the president of the Republic and his ministers' reports give some idea of the sad plight of the nation. For example, the Minister of Finance reported that the total commerce for the preceding year was only \$2,189,742. The Minister of Justice and Public Instruction reported that there had been no administration of justice and that none was possible so long as the laws remained contradictory and good judges nonexistent. Only five schools were provided for, each of which was to meet the needs of 40 students—this for a population of about 150,000! The Minister of Agriculture said that conditions were a little better than in the previous year but were still very bad. It was natural that in these circumstances the efforts of inexperienced and often uneducated men to govern well would be a failure, which often led to revolutions or costly mistakes and delayed progress.

A further consequence of ineptitude in politics and inferiority in numbers in relation to Haiti was the desire for benevolent protection by some strong foreign state. As early as 1843 a commission of Dominicans had asked the Spanish captain-general of Cuba for aid in separating the former Spanish colony from Haiti, but nothing came of this plan. In 1845 a committee of Dominicans made overtures for annexation to the United States government, but the efforts were fruitless. Dominican representatives were also active in Paris and London, and several proposals for annexation were made to the government at Madrid. No power, however, was prepared to assume an unattractive and dangerous responsibility in the face of certainty of opposition by the United States.

IV. ANNEXATION TO SPAIN

The situation changed with the approach of the American Civil War, and Pedro Santana, who returned to power in 1858, was able to arrange for the reannexation of the country to Spain. This was formally proclaimed on March 18, 1861. There was no opposition from Great Britain or France. The United States expressed strong disapproval, but the outbreak of the Civil War made it impossible to take any effective action.²⁰

From the very beginning of the Spanish annexation there were attempts at insurrection in various parts of the country. One of the original Trinitarians of 1838 paid with his life for his attempted rebellion in June of 1861. On August 16, 1863 a revolt began in the northeast, and by September it had spread to other sections. The fighting lasted until 1865, when Spain, confronted by the certainty of serious complications with the United States, withdrew from the island. On May 1, 1865 the Queen of Spain signed a decree repealing the act of annexation.²¹

Intellectual advances during the years from 1844 to 1865 were of minor importance, but some developments deserve brief mention. *El Dominicano*, a newspaper, appeared in 1845, and other periodicals soon followed. The university re-opened and operated on a partial program after 1844. By 1847 it was offering new courses in philosophy and mathematics. The seminary was re-established in 1848, and some years later the College of San Buenaventura was created for advanced study in literature and the sciences.

V. THE SECOND REPUBLIC

Báez and the United States. Santana died in 1864, but his partisans continued to combat Buenaventura Báez, who became president after the Spanish withdrawal. He was overthrown after a few months, and then returned to power in 1868. In an effort to maintain himself, Báez now revived the idea of a foreign protectorate, turning

²⁰ C. C. Tansill, *The United States and Santo Domingo, 1798-1873* (1938), p. 212. For text of advices by U. S. agents see H. M. Wriston, *Executive Agents in American Foreign Relations*, pp. 458 ff. Compare also David Yuengling, *The Spanish Annexation of the Dominican Republic* (1940).

²¹ For the War of the Restoration, compare Pedro M. Archambault, *Historia de la Restauración* (Paris, 1938), and also José de la Gándara y Navarro, *Anexión y guerra de Santo Domingo* (Madrid, 1874).

this time to the United States. The American government had long been interested in obtaining Samaná Bay as a coaling station, and negotiations for this purpose had been going on since 1865. In 1869 two American adventurers named Cazneau and Fabens, who had concessions of various sorts in the Republic, obtained the ear of President Grant, and an American envoy visited Santo Domingo and signed treaties providing for the annexation of the Republic to the United States and for a 99-year lease on Samaná Bay. The bitterness of the senatorial opposition to Grant, however, prevented their ratification.

Heureaux. Báez was supported by the American navy as long as the treaty negotiations were pending, but in 1874 he was overthrown by revolution. Thereafter the country was torn by almost continuous civil war until the advent of Ulises Heureaux, who was president in 1882-84 and from 1887 until his death in 1899. Heureaux was a military dictator, who maintained order and at least gave the country the benefit of internal peace.

During the last third of the century, and especially during Heureaux's administration, there was a considerable amount of economic progress. Sugar, cacao, and tobacco plantations were expanded, commercial banana cultivation began, and improvements were made in transportation and communications. Especially important was the establishment of sugar mills by planters who came from Cuba during the ten years' war in that island (1868-78). By 1885 there were other industrial plants such as soap, chocolate, ice, match, and several cigar and cigarette factories, and one alimentary paste factory, two tanneries, and four brickyards in the capital.²²

In 1890 cacao was the second crop of importance in terms of capital invested. About \$85,000 was invested in four plantations comprising more than 7,000 acres. Exports from these plantations increased from 387,408 pounds in 1881 to 1,633,184 pounds in 1888. Tobacco figured as an important crop in 1890, with about 15,000 acres given over to its cultivation. Except for two plantations, however, the plant was carelessly cultivated and poorly harvested on very small patches of land. Exports of 175,637 quintals of leaf tobacco in 1887 represented a 300 per cent increase

²² Hipólito Billini, *Present Condition of the Dominican Republic* (1885).

as compared with 1881. Coffee was another major crop, but it was very badly cultivated, inadequately shaded, and indiscriminately harvested. A Boston company in Santa Capuza, district of Samaná, with an invested capital of some \$40,000 began to export bananas in 1889, shipping 10,135 stems in that year. Out of an estimated 164,000 acres of cultivated land in the Republic about one-fourth was devoted to sugar, cacao, tobacco, coffee, and bananas, and 125,000 acres more were given over to subsistence crops.

Exports of wood of all kinds more than doubled from 1881 to 1889, being 15,382 tons in the former year and 37,122 in the latter. The Ferrocarril Central Dominicano between Santiago and Puerto Plata provided a new outlet for the rich Cibao area. An electric lighting system was installed in the capital January 5, 1896, and within a few years the other major cities were similarly equipped.²¹

Much of this progress was due to the establishment of order under a strong government. On the other hand, Heureaux's transactions with foreign bankers involved the government in increasingly serious financial difficulties.²¹ The Dominican government had floated its first foreign loan in 1869, under a contract by which the British firm of Hartmont and Company was to provide £420,000 by the sale of bonds, of which amount the government was to receive £320,000 (of which the Republic actually got only £38,000) and the bankers £100,000. The receipts of the customs houses of Santo Domingo and Puerto Plata were pledged as security. The issue was not a success, and the government ultimately was saddled with a "debt" of £757,700, which was the nominal value of bonds sold on the London market by dextrous manipulation.

Heureaux in 1888 made an agreement with the Dutch firm of Westendorp and Company for an emission of 6 per cent bonds to a total of £770,000 to pay the internal debt of the country and to convert the Hartmont bonds at the rate of five to one. To service the loan, 30 per cent of all customs receipts were pledged, and the

²¹ H. Thomasset, "La Republica Dominicana en 1890," *Gaceta Oficial*, año 18 (1891), Nos. 856-64.

²² See Max Heuríquez Ureña, *Los Yankis en Santo Domingo* (Madrid, 1921); and Sumner Welles, *Nabot's Vineyard: The Dominican Republic, 1814-1924* (1928).

bankers were authorized to control the operations of the customs houses in order to collect directly the proportion due them. In May 1890, the Dominican government contracted another loan with Westendorp and Company for £900,000 for the construction of the railway from Puerto Plata to Santiago. Both loans were badly handled by both contracting parties and neither brought about any improvement in the country's finances.

In January 1893, after the failure of the Westendorp firm, the Dominican government approved the transfer of its claims and privileges to the San Domingo Improvement Company of New Jersey. In the same year the Improvement Company refunded the Westendorp bonds of 1888 and 1890 with an issue of £2,035,000 of "Consolidated Gold Bonds of the Dominican Republic" at 4 per cent interest. An additional \$1,250,000 issue of 4 per cent gold bonds was also put on the market by the Improvement Company at this time. Another issue of \$1,250,000 was sold by the company in 1894 and still another of \$1,750,000 to pay an indemnity to the French government (for claims made on a banking contract and for the murder of a naturalized French citizen in Samaná) in 1895. In 1897 an issue of £500,000 at 4 per cent was issued to build a railroad from Moca to Santiago. Finally, in August 1897, when the government had defaulted on the previous issues, a grand refunding scheme was approved involving a loan of £4,236,750, of which £1,500,000 were to pay 4 per cent and £2,736,750 were to pay 2 per cent. Forty-eight per cent of all government revenues were pledged to service the debt.

Political events, 1899-1916. When Heureaux was murdered by political opponents in 1899, the public debt had reached a staggering figure of well over thirty million dollars.²⁵ The exact figure has never been determined as some of the "debt" of the country was made up of highly inflated claims of various kinds and these items were partly due to foreign claimants and partly to Dominicans who had made personal loans to the government at very high

²⁵ As a result of investigations by Professor Jacob Hollander of Johns Hopkins University in 1905 the public debt of the Republic as of June 1, 1905 was set at \$40,269,404.83. This figure includes additions due to claims placed against the government as a result of revolutionary disorders and damages, 1899-1905.

interest rates. A period of disorder followed, with several changes of government. It was impossible to meet obligations to foreign creditors, and disagreements between the authorities and the Improvement Company caused much ill feeling. Through the mediation of the United States Department of State the Improvement Company finally reached an agreement (January 31, 1903) with the Dominican government whereby the latter would pay \$4,500,000 instead of the \$11,000,000 which the company claimed. One installment was paid, but revolutions in April and November upset the plan. Meanwhile the inability of the Improvement Company to meet payment on the bonds held in Europe and the accumulation of revolutionary claims had caused trouble with several foreign powers, which brought pressure on the United States to intervene in the Dominican Republic.

In the face of a threat of joint action by the European powers, President Theodore Roosevelt entered into a treaty with the Dominican government in 1905 under which the United States was to collect all Dominican customs revenues and attempt a general settlement of the Dominican public debt. When opposition in the United States Senate prevented ratification, a customs collectorship was nevertheless established under an informal agreement, and for the next two years 55 per cent of the customs revenues were held in trust for the creditors. A new treaty signed on February 8, 1907, was approved by the Senate. This established the customs collectorship on a definite basis and provided for a \$20,000,000 loan by which all the outstanding obligations of the Republic were to be refunded.

After Ramón Cáceres, the man who had killed Heuraux, became president in 1906, conditions in the Republic became more stable. The new financial arrangement worked well and the government, with ample funds at hand for public works, maintained order with little difficulty. In 1911, however, Cáceres was murdered by political enemies, and there began a period of constantly increasing disorder. Several presidents held office for a short time only to be forced out by the opposition. The United States vainly attempted to persuade the various factions to co-operate in establishing a more stable régime and repeatedly remonstrated with the

Dominican authorities because of the constant increase of the internal debt, which was considered a violation of the Treaty of 1907.

In 1914, when much of the country was in a state of anarchy, the United States insisted that the contending factions lay down their arms and agree upon a provisional president who would conduct elections for a constitutional government. This plan was accepted and the elections, which were to some extent supervised by the United States, resulted in the choice of Juan Isidro Jiménez, who took office as president on December 5, 1914.

Jiménez had the promise of American support in maintaining himself, but he was confronted with more and more insistent demands from the Department of State for the appointment of an American financial adviser and the creation of a constabulary under American officers. The government rejected these demands and, despite the efforts of the United States to support it, its position became more and more precarious. Finally Jiménez broke with Desiderio Arias, the minister of war, who had been building up his personal power in the army, and the latter retaliated by seizing control of Santo Domingo City. American marines at once entered the city and forced him to withdraw into the interior, but at this point Jiménez resigned rather than accept foreign military aid. With the administration in the hands of a weak provisional government, composed of members of the Cabinet, and with Arias under arms in the interior, the United States found it necessary to extend its military control and American forces soon occupied most of the country.

The Dominican congress elected a new president, Francisco Henríquez y Carvajal, but the United States refused to recognize him, pending an agreement on the reforms which it considered necessary for the maintenance of stable government. Finally, in November 1916, Captain Knapp of the United States navy formally established an American military government, which ruled the country during the next eight years.

VI. THE AMERICAN OCCUPATION

The achievements and failures of the military occupation have been described at length and heatedly by writers in the United

States²⁶ and by Dominicans.²⁷ The chief accusations against it have usually been based on the consequences of martial law, overly harsh at times, and the individual acts of violence committed by the American marines. Occasional barbarities committed in fits of anger or drunkenness provided material for dramatic and impassioned literary attacks upon the "colossus of the north." The censorship of the press made martyrs of men like Fabio Fiallo and Americo Lugo. Some of the economic measures adopted by the military authorities were ill advised. The high cost of some of the public works completed was another source of Dominican resentment, even though the fault was partly in the general high level of post-war prices. It was felt that the tariff of 1919 worked to the advantage of American manufacturers and to the disadvantage of domestic Dominican industries; but the Dominicans later nullified its effects by putting "sales and consumption" taxes into effect in 1925.

The achievements of the occupation were chiefly in the field of public works and of education. In the former the leading accomplishment was the completion of a cross-country road from Santo Domingo to Monte Cristi. Some good bridges, improved port works, better postal service, and improved sanitation were other services rendered with beneficial results. The system of public instruction was reorganized, with Dominicans and Americans working together to effect needed reforms and a vast expansion of school facilities. An attempt to establish an agricultural college failed for lack of interested students, but an experiment station contributed notably to the improvement of agriculture and animal husbandry in the Republic. A well-trained police force, a geological survey, some improvements in governmental organization and accounting, and the passage of the Land Registration Act of 1920 were also accomplishments deserving of mention.

Economic conditions during the occupation naturally were not

²⁶ M. M. Knight, *The Americans in Santo Domingo* (1928), is typical of the "anti-imperialist" writing.

²⁷ Antonio Hoepelman and Juan Senior, *Documentos históricos que se refieren a la intervención armada de los Estados Unidos de Norte América* (Santo Domingo, 1922); Max Henríquez Ureña, *Los Yanquis en Santo Domingo* (Madrid, 1921); Federico Henríquez y Carvajal, *Nacionalismo* (Santo Domingo, 1925).

normal. In the first place, the effects of the World War had begun to be felt in the country by the time the occupation was set up. The price of sugar soared from 1915 to 1921, when it dropped abruptly to cause disastrous upsets in the sugar economy of the island. The high prices paid for land and for wages, and the advances paid to *colonos* to grow cane, created a temporary prosperity, followed by a disastrous collapse after the war. Castor bean oil also brought a very high price during the war, owing to its efficiency as a lubricant for airplane engines. A vast acreage was given over to the cultivation of the plant to the detriment of other crops traditionally grown in the country. The sudden cessation of demand for this product at the end of the war was another depressing factor.

The total foreign trade at the beginning of the occupation (1916) was over 33 million dollars, an increase of almost 9 million over 1915, half of which was made up by the increase in value of sugar exports. Cacao and tobacco exports also increased in that year.²⁸ In 1917, after the United States entered the war, the Dominican Republic was declared to be a neutral by our War Trade Board, despite the fact of the military occupation. It was therefore placed upon the embargo list of both exports and imports, and the delays in getting trading licenses, plus a shortage of tonnage, affected trade considerably. Cacao, particularly, suffered from the shortage of ships.

On the whole, however, trade was good up to December 1920, and then came the terrific depression in which all business was paralyzed and merchants found themselves caught with huge stocks purchased at "boom" prices. The influence of the depression on the cacao and tobacco market meant more to the average Dominican than did its effect on sugar, largely a foreign-owned industry. Exports of castor beans also fell off in this year to less than one-eighth the previous year's value.

Conditions improved during the next four years and by 1924, when constitutional government was restored, the general outlook was good. Prices for cacao, coffee, and tobacco were higher and the presence of over 400 miles of good roads facilitated the trans-

²⁸ Dominican Customs Receivership, *Report of the Tenth Fiscal Period . . . 1916* (1917), pp. 7-8. See subsequent annual reports for summaries of commerce and general conditions.

port of these products to ports and domestic markets. In December 1924, an ambitious irrigation program was begun which promised to open arid land to active use. Banking facilities were ample, and with new cable communications through All America Cables, Inc., and a wireless station in Santo Domingo, the country was well equipped to participate in modern international economic relations. By 1925 there were 22 sugar mills with an assessed valuation of almost 4½ million dollars holding 438,182 acres of land.²⁹

VII. THE THIRD REPUBLIC, 1924-

When the United States forces withdrew, in 1924, Horacio Vásquez, who had been the chief opponent of Jiméncz before the intervention, became president, and the old lines re-formed with most of the Jimenista group in the opposition.

In June 1927 Vásquez had the constitution amended in order to extend his term until 1930, an addition of two years. Late in 1929 the constitution was changed again, restoring the four-year term but eliminating the prohibition of re-election. In January 1930 Vásquez declared himself a candidate for a new term, but a revolution in Santiago forced him to resign. In May, General Rafael Leonidas Trujillo Molina, the commander of the army for the preceding five years, was declared elected president, and Rafael Estrella Ureña vice-president. These two, backed by a coalition of six political parties or factions, took office August 16, 1930.

At the beginning of his administration, 18 days after the inauguration, General Trujillo was confronted with the appalling task of reconstructing the city of Santo Domingo, which had been devastated by a hurricane on September 3. In this disaster more than 2,500 persons lost their lives and upwards of 20,000 were injured. Property damage was estimated at \$20,000,000,³⁰ but fortunately the storm did very little damage to the rich agricultural areas in the interior of the country. Aid from the United States and neighboring Latin-American countries was prompt and generous, and under the vigorous leadership of the president, the city soon re-

²⁹ Knight, *The Americans in Santo Domingo*, p. 139.

³⁰ Dominican Customs Receivership, *Report of the 21th Fiscal Period*, . . . 1930 (1931), pp. 12-14.

established its commerce. Rebuilding began as fast as ruins were cleared away.

On August 16, 1931 the Partido Dominicano (Dominican party) was created and officially recognized by the Central Electoral Committee. This was the only political party until 1940 when José Enrique Aybar organized the Partido Trujillista.

In 1934 the National Congress bestowed the titles of Generalísimo and "Benefactor de la Patria" on President Trujillo. Following a reorganization of the University of Santo Domingo he was given its first doctorate *honoris causa* (1934). In 1938 congress declared him "The First and Greatest of the Dominican Chiefs of State," and on November 2, 1940 he was given the additional title of "Restorer of the Financial Independence of the Republic." In 1936 the name of the old city of Santo Domingo was changed to Ciudad Trujillo by action of the national congress.

President Trujillo, with Jacinto B. Peynado as vice-president, served a second term from 1934-38, after which Peynado was elected president and Dr. Manuel de Jesús Troncoso de la Concha vice-president. When President Peynado died March 8, 1940, Dr. Troncoso became president of the Republic. The 1934 and 1938 elections were uncontested by other aspirants, there being only one political party.

By the Trujillo-Hull treaty, signed September 24, 1940, the American customs receivership was abolished and the collection of customs restored to the Dominican government. Payment of the bonds still outstanding (\$14,517,000 as of July 1, 1941), and their interest charges of 5½ per cent, were guaranteed without reference to any particular source of government revenue.

In May 1942 General Trujillo was re-elected to the presidency without opposition. Without awaiting the expiration of his legal term, Dr. Troncoso appointed General Trujillo to his cabinet and then resigned so that General Trujillo at once became president under the provisions of the Dominican constitution.

In recent years several first-class steel bridges have been erected over the major rivers, thus facilitating both promptness in the general course of transportation and delivery of freight by road. The highway system has been expanded steadily, bringing the mileage

of good roads up to about 1,000.³¹ There are other secondary roads passable only in the dry season. The port of Ciudad Trujillo was efficiently modernized in 1938 to admit big ships, which previously had been obliged to anchor in the roadstead and transfer freight and passengers by lighters. Irrigation canals have been constructed in various parts of the country to the decided improvement of agriculture in those areas.

Communication facilities have been improved and expanded steadily during the past decade. A radio station HIN was inaugurated in August 1936 by the Partido Dominicano, and other radio stations are to be found in the capital (HIX is the biggest) and in other cities. Telephone service is now available between almost all parts of the country and its capital, and the latter has connections with Cuba, Puerto Rico, and the United States.

The development of cultural and intellectual services has been notable in the past decade. In 1931 the Dominican Academy of History was organized with the venerable scholar Dr. Federico Henríquez y Carvajal as its president. The year after the founding of this academy the Dominican Athenaeum was opened in Santo Domingo City. It has since been a center of cultural activity, offering lectures, concerts, recitals, and art exhibitions. In 1932 the Dominican Academy of Language was established. Numerous congresses of a literary or scientific nature, and of international as well as domestic representation, have served to stimulate the work of the university in furthering advanced studies of modern social problems.

A much-needed depository for documents of the Dominican Republic was provided in 1935 with the creation of the "General Archives of the Nation." The archives are adequately housed, and under the direction of Emilio Rodríguez Demorizi the work of organizing material and the publishing of an excellent *Boletín* has been successfully carried on. The archival material in the cathedral has recently been organized. Unfortunately, however, a large part of the country's historical records, secular and clerical, were destroyed in past years.

³¹ *Anuario Estadístico*, 1939, Vol. 2, p. 597.

CHAPTER V

THE DOMINICAN PEOPLE

A census of the Dominican Republic taken in 1920 by the American military government reported a population of 894,665. In 1935, the second official government census, taken by volunteer workers of the Dominican party, showed 1,479,417 inhabitants. The estimated population as of January 1, 1940 was 1,650,019.¹ This would mean an increase of more than 84 per cent in the course of 19 years. Since there has been little immigration, and since the excess of reported births over reported deaths is not sufficient to account for such an increase, it would seem that there were errors either in the 1920 or the 1935 census or in the vital statistics. What seems most probable is that disturbed conditions at the time of the 1920 census made a complete count impossible. All of the data available, however, indicate that the population has been increasing rapidly throughout the twentieth century. The following table

AVERAGE INCREASE IN POPULATION OF THE DOMINICAN REPUBLIC,
BY DECADES, 1900-40^a

Decade	Estimated Population at End of Decade	Population Increase from End of Previous Decade	Average Yearly Increment during Each Decade	<i>Average Rate of Increase in Each Decade^b</i>
1931-1940	1,650,019	391,104	39,110	3.2
1921-1930	1,258,915	364,250	36,425	4.1
1911-1920	894,665	261,896	26,190	4.1
1901-1910	632,769	159,546	15,945	3.5
1891-1900	473,223	...	...	...

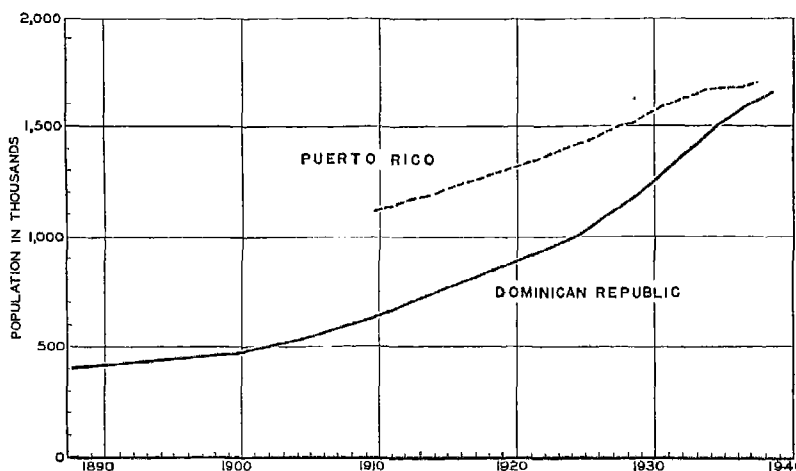
^a Compiled from *Anuario Estadístico*, 1938, Vol. 1, p. 93; and the same, 1939, Vol. 1, p. 311.

^b Average yearly increment as a percentage of population at the end of the previous decade.

shows the increase by decades since 1900, based on official estimates. The chart on page 82 presents graphically the growth of population since 1888, and compares it with the growth of population in Puerto Rico.

¹ *Anuario Estadístico de la República Dominicana*, 1939, Vol. 1, p. 311.

POPULATION GROWTH IN THE DOMINICAN REPUBLIC
AND IN PUERTO RICO, 1888-1940^a



^a *Anuario Estadístico*, 1938, Vol. 1, p. 93, and 1939, Vol. 1, p. 311.

I. URBAN AND RURAL POPULATION

Dominican statistics indicate that in 1935 population was distributed by rural and urban districts as follows:

	Number	Percentage of Total
Rural	1,215,792	82
Urban	263,625	18
Total	1,479,417	100

No definition of urban population accompanies the published data. The size of the urban total, however, indicates that it must include the population of all cities and towns, some of them of very small size and having none of the characteristics of urban centers. Principal cities and towns of the Republic were reported to have the following population in 1935:²

Ciudad Trujillo	71,297
Santiago de los Caballeros	33,919
San Pedro de Macorís	18,889
Puerto Plata	11,777
La Romana	10,935
San Francisco de Macorís	10,305
La Vega	9,342

² *Statesman's Year-Book*, 1940, p. 828. Usual sources of official population data do not give the population of towns.

Population by urban and rural zones and by provinces, excluding 73,070 aliens, as reported by the 1935 census, is shown in the table below.

According to the 1935 figures, it would appear that the density of population per square mile is 77. This is one-sixth that of Puerto Rico, one-third that of Haiti, two-thirds that of El Salvador, and approximately the same as that of Cuba and Guatemala. It is greater than in any of the other independent states of the Western Hemisphere.^a Comparative figures for population density, how-

POPULATION OF THE DOMINICAN PROVINCES, 1935^a

District of Santo Domingo and Provinces	Urban	Rural	Total
District of Santo Domingo	66,825	22,076	88,901
Santiago	39,479	152,890	192,369
La Vega	13,828	102,002 ^b	165,830
Trujillo	15,086	143,451	158,537
Azuá	14,225	139,150	153,375
Seibo	18,112	96,901	115,013
Duarte	14,225	106,113	120,338
Puerto Plata	13,449	86,521	99,970
Barahona	15,045	61,079	76,124
Monte Cristi	7,192	75,851	83,043
Españillat	8,836	72,249	81,085
San Pedro de Macorís	16,749	30,943	47,692
Samaná	6,853	17,217	24,070
Total	249,904	1,156,443	1,406,347

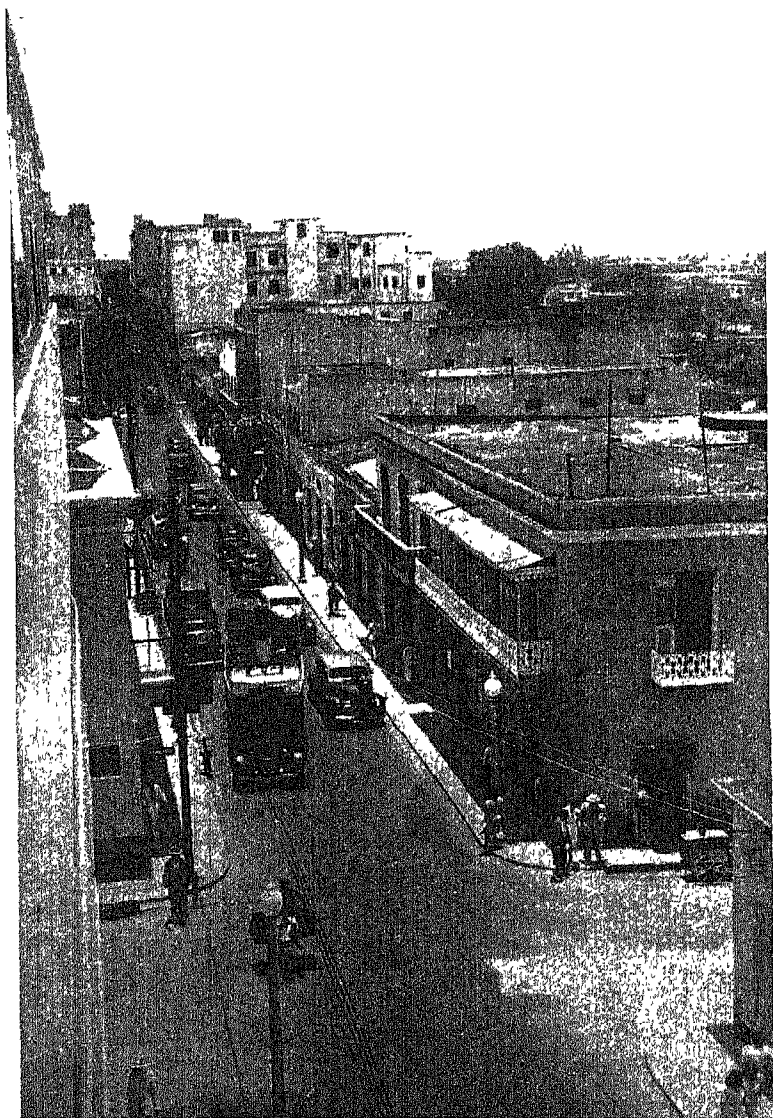
^a *Anuario Estadístico*, 1936, Vol. 1, p. 95.

^b Evidently a typographical error in the *Anuario Estadístico*; figure should be 152,002 to produce totals as given.

ever, can be misleading unless consideration is given to factors such as topography, soil and rainfall conditions, degree of industrialization, size of nearby trading areas, political ties, and direct or indirect economic aid from affiliated political divisions. "Over-population" is an expression used to designate a complex of economic factors, only one of which—and not necessarily the principal single factor—concerns the actual number of people living on a square mile of land.

If rural population alone be taken into consideration, we find that the Dominican Republic, with an average of 68 per square mile, has a greater density than many other comparable tropical areas.

^a *Anuario Estadístico*, 1939, Vol. 1, p. 334.



STREET IN CIUDAD TRUJILLO

Cuba has 62 persons per square mile in the rural districts, and all of the Central American countries except El Salvador have less than 68. This shows the inaccuracy of the statement frequently made that the Dominican Republic is a relatively thinly populated and undeveloped country. It does not suffer severely from overpopulation as Haiti and Puerto Rico do, but it cannot be said to have a great amount of unoccupied land for new immigrants. Its capacity to absorb newcomers is further limited by the fact that it does not have large urban centers which furnish markets enabling

RURAL POPULATION DENSITY OF THE DOMINICAN REPUBLIC
COMPARED WITH SIMILAR TROPICAL AREAS^a

Country	Number of Square Miles	Rural Population	
		Number	Number per Square Mile
DOMINICAN REPUBLIC.....	19,332 ^b	1,313,000 ^b	68
Cuba.....	44,164	2,717,000	62
Puerto Rico, Haiti, Jamaica.....	18,008	5,145,000	285
Central America ^c	218,283	6,148,000	28
Colombia, Venezuela, Peru.....	1,274,000	17,363,000	14
Philippine Islands.....	114,400	12,334,000	108
Hawaii.....	6,407	368,000 ^d	57 ^d
Ceylon.....	25,332	5,375,000	212
Gold Coast.....	79,000	3,506,000	45
Palestine.....	9,000	813,000	90
Syria and Lebanon.....	57,900	2,910,000	50
Madagascar.....	241,094	3,551,000	15

^a Computed from *Statesman's Year-Book*, 1940.

^b *Anuario Estadístico*, 1939, Vol. I, p. 13.

^c Honduras, Guatemala, El Salvador, Nicaragua, Costa Rica, Panama.

^d Total population, without deduction for urban areas.

rural areas to support exceptionally large populations. The population of the Dominican Republic is over 80 per cent rural,⁴ and in view of the considerable areas which are unsuited to cultivation or pasture, the density per square mile of tillable or otherwise usable land is high. The greatest concentrations of population are in the Cibao and in the District of Santo Domingo, which includes the capital, Ciudad Trujillo, and its environs.

In 1935 the total foreign population was reported as 73,070. Over 5,000 of these were in the District of Santo Domingo. Most of the others were in the southeast end of the island and in the provinces along the Haitian border, particularly in the southern-

⁴ *Anuario Estadístico*, 1938, Vol. I, pp. 125 ff. for subsequent data.

most of these provinces, Barahona. This foreign population was made up largely of men, about two-thirds of whom were classified as single, indicating the presence of a fluid foreign labor supply, mainly Haitian and English or Dutch West Indian in nationality. Five-sevenths, in fact, were Haitians; about one-seventh English or Dutch West Indians, and the remaining one-seventh largely Puerto Ricans. The total non-Caribbean foreign population was only slightly over 6,000, or about 8 per cent of all foreigners in the nation.

The actual amount of foreign blood in the Republic could be determined only by a careful study of the nationalization of foreigners over a period of many years, and of the births of children from unions including a foreign-born parent. A rather sizable Syrian colony has been absorbed in this fashion and is gradually losing its identity through nationalization and intermarriage.⁵

The racial distribution of the population is difficult to determine with anything approaching accuracy. The census figures of 1935 indicate that about 13 per cent of the population is white, 19 per cent black, and the balance of mixed stock with the exception of 339 of the yellow race. The greatest concentration of negroes is in the southern tier of provinces: Trujillo, Seibo, San Pedro de Macorís, Barahona, and Azua, in the order named. The District of Santo Domingo has a very considerable black population, ranking second after the Province of Trujillo among the political subdivisions of the nation. These areas, with half of the total population, have almost 70 per cent of the black population of the Republic. Including the District of Santo Domingo, this southern belt has a population that is 27 per cent black as against a national average of 19 per cent. The province of Monte Cristi also has a higher percentage (25 per cent) of blacks than the average for the nation. With the exception of Monte Cristi, the concentration of the black population coincides quite closely with the distribution of the sugar industry, for which the negroes provide the chief labor supply in the fields.

The small Chinese population is located chiefly in the major

⁵ Elhimany Kassim, *Santo Domingo, Ayer y Hoy* (Santo Domingo, 1934), pp. 296 ff.

cities: the capital, Santiago, San Pedro de Macorís, and La Vega, where they are usually engaged in the restaurant business.

Law 48 of December 23, 1938 fixed an immigration tax of \$500 for "individuals of the Mongolian race and the naturals of the African continent that are not of the Caucasian race, as well as



A VILLAGE STREET

for persons of the masculine sex of more than 16 years and of the feminine sex of more than 18 years that lack nationality or who have lost that which they had without acquiring a new [nationality]."⁶ The last category included many European refugees, but exemption was provided for those brought in by the Dominican Republic Settlement Association. It is worth noting that this tax produced \$89,765 in revenue in 1939 and that the item was headed *entrada judíos* (Jewish entrance tax).⁷

⁶ *Gaceta Oficial*, No. 5258, or *Colección de Leyes*, Vol. 1 (1938), p. 635.

⁷ *Anuario Estadístico*, 1939, Vol. 2, p. 687.

II. HOUSES AND LIVING CONDITIONS

Outside the cities, the great majority of the Dominican people live in very simple houses, known as *bohíos*.⁸ These are constructed of split royal-palm siding and thatched with palm leaves. There are usually two rooms, generally with dirt floors. A secondary shed or shelter serves as a kitchen and possibly a storage place or a night-pen for pigs. Occasionally a third outbuilding is constructed as a washroom, and there may be a simple outhouse used as a latrine. Heavy rains and strong winds make these houses uncomfortable and even unsafe, but they are easily reconstructed or replaced if destroyed. Housebuilding is often the occasion for a *junta* or work-group similar to houseraising "bees" in the frontier society of the United States. Many of these rude houses have flowers planted around them, and they usually are kept as clean as the construction permits and as is possible without doors to restrain livestock. Slightly superior houses have pine siding and floors and others of still a third category have wood or corrugated iron roofs. Houses in the latter category usually have three or four rooms and sometimes a narrow gallery or porch that adds much to the coolness and little to expense.

The rude *bohíos* of the first category cost no more than a few dollars; in many cases, nothing at all in cash. Houses of the second group cost from \$5 to \$50, depending on the size, location in the country, newness and quality of lumber, and so forth. Those in the third category run from \$50 to \$500, again varying with the proximity to a sawmill. A good wood house can be built at Jarabacoa for \$500 because of the presence of a big sawmill and cheap labor. Above these three groups come the small plaster and tile houses, which cost up to \$1,000, and the more pretentious urban dwellings costing several thousand dollars. The latter are confined almost entirely to the major cities and to the sugar estates or other foreign-owned properties. It is very rare to see a house in the countryside that is not built entirely of wood, except for tile floors and concrete foundations.

Outside the major cities there are few modern facilities in the

⁸ According to the "1935 census of habitations" there were 168,139 such *bohíos*, 62,000 *casas* (houses), and 2,131 *barracones* (barracks) chiefly for the army, etc. Compare *Anuario Estadístico*, 1939, Vol. 1, p. 177.

houses. Kerosene is the principal fuel for lighting. Water is carried by head-and-hand or by burro, in gourds or five-gallon cans, from the nearest well or river. Whether used in a simple brazier or in an elaborate tile stove, the fuel for cooking is invariably charcoal, sold from house to house by itinerant peddlers. In the vast majority of the homes there are practically no other conveniences. Electrical



A HOME IN YUNA VALLEY

equipment is for the privileged few and even good utensils for cooking are rare. It is not uncommon to enter houses of the *campesinos* which are almost barren of furniture, or which at most have a few chairs and a table worth altogether not more than two or three dollars.

III. DIET

The diet of the average Dominican has changed very little from what it was in pre-Columbian days. Yuca, plantains, corn, and the native type sweet potatoes are the main items of food. These four vegetables plus a very little meat are combined in a stew in what

is often the family's only cooking utensil to form the national dish, *sancocho*. Coffee is invariably part of the daily diet, usually taken early in the morning with bread, and as often thereafter as the family income permits. The present coffee protection laws have raised the price of this staple to 10 cents a pound for the poorest grades. The high prices of salt (6 cents a pound for milled and 4 cents a pound for rock salt) and of sugar (6 cents a pound for refined and 4 cents a pound for crude), as well as the relatively high cost of meat, tend to keep living standards down.

Rice and beans are often thought of and occasionally referred to as the chief dish of the Dominicans. The former has even been called "the main item of daily food in the Dominican diet."⁹ This is undoubtedly true among the Dominicans who have some cash income or who produce rice themselves or live close to a rice-producing area, but rice costing 5 or 6 cents a pound and beans costing between 3 and 5 cents a pound are luxuries for the mass of people. So also is meat. According to government figures the per capita consumption of beef, pork, lamb, and goat combined dropped from 11 kilograms 251 grams in 1937 to 9 kilograms 631 grams in 1938 and 8 kilograms 678 grams in 1939.¹⁰ Figures for subsequent years will probably show a further decrease owing to the increasing population and static or decreasing purchasing power. From these figures it appears that the average person consumed less than an ounce of meat per day in 1938 and 1939, but unreported home slaughter may have increased this amount. Though chickens and some turkeys supplement this consumption considerably, meat apparently is not a prominent item in the diet of most people.

The diet of the Dominican *campesino* or town *peon* is a very monotonous one except when such fruits as oranges, sweet limes, and mangos are in season. Imported salt fish, or smoked fish, is commonly sold in all *pulperías* (little general stores) and usually these shops have a box or two of various kinds of alimentary pastes, both imported and domestic. Sweets (*dulces*) made of coconut, figs, guava, *jagua*, and other fruits, and sometimes milk, are sold and

⁹ U. S. Department of Agriculture, *Foreign Crops and Markets*, Vol. 43, No. 5, p. 122.

¹⁰ *Anuario Estadístico*, 1939, Vol. 2, p. 177.

consumed in all parts of the country. Honey is cheap and for many people it provides a good source of food energy. Cheese also figures in the diet of many areas. Beverages in addition to coffee are chiefly rum or raw *aguardiente*, coconut milk (*agua de coco*), and cheap *refrescos*. Beer is expensive, and milk is relatively high and difficult to distribute because of lack of refrigeration.

Tobacco is consumed by the masses of the people in the form of *andullo*, a native variety of molasses-cured tobacco sold in slices from a long roll and used for pipe-smoking. Cigars are cheap. Cigarettes cost 10 to 25 cents for packs of 20 and 15 cents for packs of 10 of better grade. To accommodate poorer customers, *pulperías* sell cigarettes individually. Even these purchases often represent a joint purchase, and the cigarette is cut in half for the two buyers. Imported cigarettes are practically prohibitive in price, and imported pipe tobacco is even more expensive.

IV. HEALTH

Health conditions have improved considerably in the past ten years, and hospital facilities and clinics have been increased and modernized. There are now several good hospitals in the capital—the Hospital Padre Billini, the Hospital Internacional, the Hospital Ramfis for children, and the Hospital Marion, a military hospital—and several good clinics. Good hospitals are also to be found on the large sugar estates and in the chief cities. Some fifteen dispensaries serving the rural population are quite well distributed so that only the most inaccessible areas lack this service. More than 15,000 patients were treated in the nation's hospitals in 1939.

Among the maladies that afflict the Dominican people the tropical fevers occupy a prominent place, as well as tuberculosis, due largely to malnutrition, and syphilis and gonorrhea, which are endemic. The chief cause of suffering among the rural population appears to be uncinariasis, or hookworm.¹¹ More than 350,000 treatments for this were given in 1940.

Malaria is one of the chief plagues of the country and in some respects—loss of energy and efficiency of workers—the most costly

¹¹ Compare statement of Dr. Wenceslao Medrano, Secretary of State for Health and Charity, in *La Nación*, Feb. 19, 1941, p. 10.

of all. In 1940, there were 51,017 cases reported and over 1,000,000 treatments given. It is very probable that thousands of other cases were never entered on official records and were treated with home remedies and patent medicines. Some progress has been made in draining swampy areas. In the summer of 1941 the press carried on an active campaign urging homeowners to keep their premises free of stagnant pools and water-holding receptacles where mosquitoes might breed. The Division of Malariology of the Department of Health was considering in August 1941 the initiation of a series of weekly house-to-house inspections to discover and eliminate breeding places for mosquitoes. Screening of houses is rare, owing in part to the high cost of screen wire and in part to a desire to keep a house open to all possible breezes. In the vast majority of families, even mosquito nets are unattainable luxuries, and it is among this rural population that malaria takes its chief toll.

Intestinal fevers of various kinds are also an important cause of illness and death. Conversations with rural doctors lead one to believe that the great bulk of infant mortality is due to some one of many intestinal fevers. Dysentery (amoebic and bacillary), enteritis, and typhoid are common and deadly in many cases. Poor diet, careless preparation and preservation of food, and the impurity of much drinking water account for these diseases. The water supply is a very serious problem and in many areas the dry season means not only using water from slowly running creeks or unsanitary storage equipment but an actual inadequacy of water. Anemia is often combined with these cases of intestinal fevers, and their cure is thereby seriously complicated.

Tuberculosis is another leading cause of ill health and death. In September 1940 Dr. Robert E. Plunkett, superintendent of the tuberculosis hospitals of New York State, made a preliminary survey of conditions in the Dominican Republic relative to tuberculosis. It is now planned to have two Dominican doctors who have studied in the hospital-sanitarium La Esperanza in Cuba take charge of a new tuberculosis sanitarium on the outskirts of Ciudad Trujillo. A national Anti-Tuberculosis League was organized in the early part of 1941. Its propaganda against apathy toward and ignorance of tuberculosis has begun to bear fruit. A special fund of \$22,000 was

provided in the 1941 budget, and this sum is being supplemented by various other contributions, including a 20-cent per capita tax on persons visiting passenger vessels in the port of Ciudad Trujillo. It will take far more vigorous means than any so far provided, however, to combat this disease successfully. The increasing cost of foodstuffs, due largely to taxation, direct and indirect, will be one obstacle to building up the health of the masses of the people, which is essential for the success of any antituberculosis campaign.

Venereal diseases are common. Estimates of the proportion of the population suffering from syphilis range all the way from 50 to 80 per cent.¹² A prophylactic dispensary for men was opened in Ciudad Trujillo on October 1, 1940 and in three months 286 persons were treated. In the dispensary for women 2,653 patients were treated in 1940. This dispensary has twenty beds for the care of advanced cases. Because of the poverty of the people, only a few are able to afford the medicine necessary or to go to government dispensaries for a complete cure, to say nothing of obtaining private medical care.

In an endeavor to reduce infant mortality and improve the care of mothers, the government has made plans for a maternity institute to be constructed in Ciudad Trujillo. This agency, as well as a service of field nurses and the training of obstetricians, will be financed by the revenues from the *cédula* of personal identity for women. This tax, already applying to men, was extended to women in May, 1941. This is expected to yield \$50,000 annually. The Dominican Red Cross has already been helpful in providing maternity care in the smaller cities and rural areas.

A school medical service has contributed notably to education in hygiene and a proposed school dental service will be of much benefit also if adequately financed and staffed. The modern and well-equipped new dental school in the University of Santo Domingo promises to provide the country with the dentists who are so badly needed.

There are three divisions of asylums under the administration of the Department of Health and Charity. For these services, exclusive of an allowance of \$2,400 yearly to aid the poor, there was a

¹² Compare *La Opinión*, editorial June 14, 1941.

total of about \$78,000 provided in the national budget for 1941. A few more thousands of dollars from general funds of the department are sometimes available for the asylums.

The insane asylum Padre Billini was inaugurated in March 1940 near Ciudad Trujillo. It has a capacity of 150 patients. For the year 1940 it reported that 22,412 persons were examined and assisted to mental recovery. Naturally hundreds of cases go unattended in the remote areas of the country.

A leprosarium a few miles out of Ciudad Trujillo is supposed to accommodate all the lepers in the Republic. The cases of leprosy among well-to-do families, however, are usually treated at home. The disease does not appear to be a serious menace at the present time.

There are two asylums for orphans, both near Ciudad Trujillo. The asylum farm Presidente Trujillo for boys is situated on the road to San Cristóbal, near Jaina beach. It is equipped to accommodate 100 boys. There are shops for instruction in tailoring, carpentry, and shoemaking, and also a model chicken farm. An asylum for 100 orphaned girls, the Asilo Angelita, was finished in May 1941. When completely equipped it will provide the same facilities for vocational training and practical gardening and chicken raising.

Poor relief is largely cared for by private agencies and the churches, with some government help. Begging is rare in the capital except on Saturday, when the aged and the crippled are allowed to beg.

V. EDUCATION

According to the 1935 census,¹⁸ out of 1,133,135 people over seven years of age, only 300,078 were able to read and write, and 2,173 claimed to be able to read only. Hence about one-quarter of the population of school age or over may be called literate. The proportion varies from the District of Santo Domingo, with a literacy rate of almost 62 per cent, to the province of Azua with 12.4 per cent. The low literacy areas are in most cases those with the largest negro population.

Public instruction in the Dominican Republic is directed by a

¹⁸ *Anuario Estadístico*, 1938, Vol. 1, pp. 141-43.

Secretary of State for Public Education and Fine Arts.¹⁴ Approximately 10 to 11 per cent of the national budget is set aside for the use of this department. In the budget for 1941 the actual amount of money in all departments designated for purposes that properly come under the work of this department was 13.5 per cent of the total expenditures,¹⁵ or approximately \$1,500,000.

Primary school education is free and compulsory for children from 7 to 14 in all places where official schools exist. There are two classes of primary schools: the rudimentary, where for three years the studies are largely concentrated on learning to read and on gardening and chicken raising; and the graded primary schools, which provide seven years of instruction in reading, writing, and arithmetic. The number of public schools in both of these categories in 1939 was 783, to which should be added 9 semi-official schools and 56 private establishments. The normal schools provide the studies necessary for training teachers and as preparation for advanced professional studies. The Republic has 11 such schools, all but one of which are public. There are 46 vocational schools and special schools for the blind, for delinquents, for illiterate adults, and so forth, of which 17 are official, public institutions; 25 semi-official; and 4 private. There are 17 special schools (including the night school for adults), all of them official and public.

The "student population" as of April 1941 was 132,627.¹⁶ This was the highest figure registered in the school history of the Republic, and it represented an increase of 8,394 students over the previous year. This increase has been due in part to the initiation of three separate daily sessions in the rural schools, thereby using to full advantage the limited housing accommodations and permitting more students to attend classes. Over half of the student population is in the rudimentary primary schools. Only 5 per cent of the total school population is found in vocational and secondary schools combined.¹⁷ The daily attendance averages 86 per cent of the en-

¹⁴ *Anuario Estadístico*, 1938, Vol. 1, pp. 396-422; and the same, 1939, Vol. 1, pp. 541-65.

¹⁵ With the exception of \$1,230,000 provided for service on the public debt of the country.

¹⁶ Editorial in *La Nación*, May 25, 1941.

¹⁷ *Anuario Estadístico*, 1939, Vol. 1, p. 554.

rollment. The instructing and administrative staff for all the schools in the country is comprised of 2,260 persons, half of whom are connected with the graded primary schools.

The number of schools has almost doubled in the past ten years.¹⁸ The student population more than doubled in the same period, the 1930 figure showing only 50,360 as against almost 125,000 early in 1941.¹⁹ These figures are evidence of the present government's determination to broaden the base of literacy and also to train children in the rudiments of efficient agriculture. The rudimentary schools in all parts of the country invariably have excellent gardens, and plans for the future include the extension of this form of practical instruction.

Night schools, and industrial, manual arts, domestic science, and commercial schools, receive a total of about \$70,000 in government support. While this is a small sum in view of the need, it represents the beginning of a good policy.

The old University of Santo Domingo receives financial support from the government,²⁰ but much of its budget is met by tuition fees of the students. The university's five faculties are law, medicine, mathematics, pharmacy, and dental surgery, with a separate school of obstetrics. There are 40 men on the instructing staff for the university. The student enrollment is 501, with medicine and law accounting for 370 of these and pharmacy only 46. Thirty of the 44 women in the university are studying pharmacy.

The most recent development in the field of public education was the announcement late in July 1941 of a plan to provide 5,000 teachers, at a salary of \$15 monthly, to teach reading and writing to children unable to attend school. These teachers are to use their own homes or whatever facilities may be had as a meeting place for the pupils. If this can be put into effect, it is expected to be of great importance not only as a means of increasing the literacy of the population but also as a source of livelihood to thousands of literate Dominicans and a means of demonstrating the advantages of learning to read and write.

Other innovations are also planned by the Department of Educa-

¹⁸ See statement of Secretary of State for Education and the Fine Arts, *La Nación*, Feb. 19, 1941, p. 11.

¹⁹ *La Nación*, Mar. 5, 1941.

²⁰ In the budget for 1941, \$30,500 was provided for the university.

tion and Fine Arts. These new projects include the creation of an Institution of Graphic Arts, the reform and expansion of the Musical Lyceum in Ciudad Trujillo, the introduction of traveling exhibitions of art, improvements in the official school of music in Santiago, and the reorganization of the Symphonic Orchestra of Ciudad Trujillo.

The supervision of the three reformatories for boys is under the care of the Attorney General of the Republic, but as this work is properly one of education it will be noted here. These three institutions are in San Cristóbal (Presidente Trujillo), Santiago (Ramfis), and La Vega (José Trujillo Valdez). Each of these is equipped with schools, shops, and a model farm. Ramfis is especially well equipped, with accommodations for 100 boys and about 15 acres of good land near the Yaque del Norte river. The reformatories received an allowance of about \$80,000 for 1941.

VI. THE PRESS

There are about 50 periodicals, including 9 daily papers, 1 tri-weekly, 2 bi-weekly and 20 weekly papers. Other periodicals cover the fields of art and letters (*Ozama* and *Ahora* being newcomers in this field); home-making (*Hogar*); movie and critical journals (the best of which is *La Cosmopolita*); agriculture and commerce (the best is *Revista de Agricultura* of the Department of Agriculture, Industry, and Labor); legislative and presidential action (the *Gaceta Oficial* and the *Boletín del Senado* and the *Boletín de la Cámara de Diputados*); judicial (*Revista Jurídica Dominicana*, organ of the attorney-general's office); military affairs (*Revista Militar*); police (*Revista Policía*); foreign relations (*Boletín de Relaciones Exteriores*); health (*Boletín de la Secretaría de Estado de Sanidad y Beneficencia* and *Cruz Roja*); education (*Revista de Educación* of the Department of Education); religious (a weekly paper *La Verdad Católica*, *Boletín Eclesiástico*, and *El Dominical*); political (*Boletín del Partido Dominicano* and other publications); the *Boletín Oficial de la Secretaría de Estado de Comunicaciones y Obras Públicas*; and several others.

Scholarly publications include the monthly *Boletín del Archivo General de la Nación*; the bi-monthly journal *Clio* of the Dominican Academy of History; the *Boletín de la Academia Dominicana*

de la Lengua and occasional monographs published by the Academy; and *Anales de la Universidad*, a quarterly publication of the University of Santo Domingo. The very useful *Anuario Estadístico* should also be mentioned.

Increasing use has been made of the radio for informative talks on health, agriculture, and general knowledge by qualified speakers from the departments of health, agriculture, and education.

VII. THE DOMINICAN SPANISH LANGUAGE

The educated classes speak and write good Castilian Spanish, but the language of the masses has Andalusian peculiarities. The most common of these, which confuses the unwarned listener, is the habit of dropping the final "s" in the termination of words and occasionally eliminating it in the body of a word. Likewise "r" is usually pronounced as though it were "l," especially when it comes at the end of a word. In keeping with most Latin-American usage, the letter "c" is given the sound of "s" before "e" and "i." Among the *campesinos* and less literate residents of the towns it is common to drop out the "d" in words ending in "ido" or "ado," and to put a "d" in front of words which properly do not have it, saying "diba" for "iba," for example. It is customary, likewise, to use a sound like the English "h" at the beginning of some words properly beginning with a vowel.

Words are commonly run together or pieced together with parts of both redistributed to form a wholly new word; and of course in a country where many areas are relatively out of touch with other sections there are many words which are meaningful only in limited regions. A surprisingly large number of indigenous Indian words are still in use, as can be seen by a study of *Palabras Indígenas* by Emiliano Tejera, one of the best philological works produced by a Dominican. Many American words, especially slang and sporting terms, have come into use through the movies and the introduction of baseball and other North American sports.

VIII. RELIGION AND THE CHURCH

The Roman Catholic Church has played a very important part in education, in politics, and in other fields.²¹ According to the Con-

²¹ Compare "El Clero en Santo Domingo" (1493 to 1908), *Boletín Eclesiástico*, Año 27, Nos. 92-110.

stitution of 1934, the Roman Catholic faith is the religion of the state, but other religions are freely tolerated. Official ceremonies usually include a *Te Deum* in the cathedral. The Church was denied the right to own land in 1822, and an attempt to recover its property in 1908 was unsuccessful. Today it can own only that needed for church buildings and seminaries. It is poor, and receives almost no government aid. Except for the item of \$1,944 for "religious missionaries on the frontier," and \$1,800 and \$2,000 for improvements and repairs in the Cathedral of Santo Domingo and the church at Boyá respectively, there was no other provision in the 1941 budget of the national government for religious purposes.²²

The Catholic population is about 98 per cent of the total, a proportion that has not changed since the 1920 census. In 1935, of 1,406,000 Dominicans only 11,500 were not Catholic. Many of the people in the country, however, are not baptized and are neither married nor buried by the Church. Undoubtedly there are thousands who have no understanding of the principles of the Catholic faith. In some places the people see a priest only once or twice a year. For many, however, especially in the cities, the Church is important and influential.

There are three shrines in the country outside the capital. One of these, in honor of the Virgin of Altigracia is in Higüey at the eastern end of the island, although the image is actually kept in a shrine at the church of Altigracia in Ciudad Trujillo. The most important is probably that at Santo Cerro on an eminence overlooking La Vega Real near the city of La Vega. The church here is a sort of Dominican Lourdes, according to Judge Otto Schoenrich.²³ It is a place of historical importance as well as of religious significance, for it was here that the miraculous appearance of Our Lady of Mercy, patron saint of the Republic, is said to have saved the day for Columbus and his soldiers in a battle with the Indians during the conquest. Thousands of pilgrims visit it yearly, and the soil from the spot where Columbus set up a cross is said to have worked many miraculous cures. A seminary, Padre Fantino, was officially

²² In an article, "Por mi religión y por mi patria," by V. J. Alfán Durán, *La Nación*, July 22, 1941, a plea was made for a \$12,000 yearly subvention to the two seminaries to alleviate the "lamentable state of the Dominican church."

²³ *Santo Domingo, A Country with a Future* (1918).

opened at Santo Cerro on March 9, 1941. A third shrine is at Bayaguana, and the church at Boyá is also the focus for many pilgrims yearly.

The rural population generally has a mixture of Catholic teachings and superstitions typical of an illiterate peasantry. "The Brotherhood of the Congo" may be found in several areas and, although forbidden, voodoo services are held and well attended. In the candlelight services and wakes for the dead, the *calvarios* or groups of three crosses along roads and at crossroads, and the *rosarios* or processions, there are evidences both of Catholic origin and of the admixture of local superstitions. Reports submitted in 1922 by inspectors of public education on the psychology and customs of the people revealed many superstitions in the beliefs of the *campesinos* in all parts of the country.²⁴

The Dominican Catholic clergy numbers only about 60. Non-preaching members of various religious orders of course increase the number of active church workers, and there are also numerous Catholic organizations with branches in all the more important towns. There are two seminaries, one in Ciudad Trujillo and one in Santo Cerro, and 14 new priests were expected to come from them in 1941. The paper *La Verdad Católica* claims a circulation of 6,000 copies weekly.

There is real freedom of religious belief, and many Protestant churches are active in the country, including Episcopalians, Anglicans, Baptists, Methodists, and Seventh Day Adventists. There are also 19 Masonic lodges, the oldest of which dates back over 100 years. Hispaniola, as a matter of fact, was the site not only of the first mass held in the New World, but also of the first Masonic ceremony, the latter taking place in 1763 in the western part of the island, then under French rule. There are now about 3,000 Masons in the country, including many of the most prominent men. The Protestant churches and the Masons provide hospitals and other social services.

The *campesino* in the Dominican Republic lives a simple life,

²⁴ From MS reports in the library of Don Julio Ortega Frier, Superintendent General of Education in 1922. In the works of Don Ramón Emilio Jiménez one may find many of these practices competently described.

very close to nature and very much dependent on it and in awe of its occasional violence. He wears charms of various kinds to ward off disease or accident; his wife, his children, and his livestock are also guarded by many superstitious devices and performances. He lives at best at a subsistence level, if not in actual penury. His "marriage" is frequently a consensual union.²⁵ His children, however, may be entered in the nearest town's civil register. It is not unusual for the *campesino* to have more than one wife. Over 60 per cent of the births are illegitimate, but by a law of October 31, 1940²⁶ voluntary recognition gives a "natural" child the same status as one born in legal wedlock. The figures of illegitimacy are not so important as they appear, because many of these children are born to couples whose union is permanent.

IX. RECREATION AND DIVERSION

The average Dominican has few recreations. For the men the cockfight is probably the major sport. Every Sunday and occasionally on other holidays and special fiestas there will be a cockfight in or near every town of any size. Games of dice are prohibited, but not eliminated, and they are often an adjunct to the cockfight, serving as a sort of *entr'acte* diversion. At present, baseball and basketball present serious threats to the pre-eminence of cockfighting. It is by no means rare to see a baseball game going on beside a cockfight pit, and of the two spectacles the former is often the better attended. The next generation is almost certain to favor these two games. For the girls volleyball has an equal appeal.

Boxing and soccer are also popular, and contests are well attended. Tennis is popular among those who can afford membership in the various clubs in the country, but it is not a common game. Golf is limited almost entirely to foreigners and especially North Americans living on the sugar estates.

Fiestas are the most common and popular diversion for both men and women, and many religious and civil holidays provide abundant excuses for merrymaking. The native dance, the *merengue*, is the main part of a fiesta, although eating and drinking are also insepa-

²⁵ In 1938, only 36 per cent of all men over 18 and all women over 15 were reported married.

²⁶ *Gaceta Oficial*, No. 5517.

rable from it. The typical orchestra for a rural fiesta is a guitar, an accordion, a drum, and a *guira* or metal gadget not unlike a lemon grater, which is scraped with a stick to emphasize the beat. A cornet may be included, and if the party has an affluent patron the orchestra will be expanded in proportion to his generosity. Good orchestras are found in the chief cities. Work "bees" for the construction of a house or the clearing of a field often terminate in simple fiestas where rum is the main item of interest and dancing, if any, is to the accompaniment of singing and hand-clapped rhythms.

The movies are well attended in all the major cities. In fact there is scarcely a town of more than a thousand people which does not have at least one theater. The capital and Santiago have many. Prices ranging from 5 and 10 cents upward make it possible for the mass of the people to see a movie fairly often if they live in or near a town.

An inexpensive and apparently very satisfying form of recreation for urban women is that of leaning on their elbows on the window sill facing the street. For hours in the afternoon they lean and watch passersby or other women doing the same thing. Some window sills are worn like ancient thresholds, attesting to the antiquity of this quiet diversion and expressing silently one facet of the Dominican philosophy of life.

Band concerts in the park are the most dignified form of entertainment, except perhaps performances in the public schools or town clubs. For the majority of the people a Saturday night band concert is still *the* occasion to dress up and parade around the public square. This recreation is limited to the towns, but radios in corner *pulperías* in small villages all over the country are bringing good music to thousands of people who until recently had never heard anything but native *merengues*.

CHAPTER VI

PHYSICAL GEOGRAPHY

The Island of Hispaniola, the largest of the Antilles except Cuba, lies approximately 700 miles southeast of Florida,¹ extending from parallel 17° 36' to parallel 19° 58' north latitude. It is just south of the Tropic of Cancer and consequently has the mild equable climate of trade wind islands within the northern tropics. Its latitude is comparable to that of Mexico City or the Island of Hawaii.

The Dominican Republic occupies roughly the eastern two-thirds of the island. With its area of 19,324 square miles, it is slightly larger than the states of Vermont and New Hampshire combined, or one-fifth again as large as Switzerland. It is one of the most mountainous countries of the Antilles. Pico Trujillo, the highest point in the West Indies, has an elevation of about 10,400 feet. On the other hand, the surface of Lake Enriquillo, on the Haitian frontier, is 163 feet below sea level.

I. GEOLOGY AND SOILS

The island has two principal mountain ranges running from east to west. The Cordillera Septentrional rises from the narrow northern coastal plain. Between that range and the Cordillera Central is the great Cibao Valley, one of the richest portions of the Republic. To the south of the Cordillera Central is the wide coastal plain on the Caribbean Sea, where most of the important sugar plantations and several of the more important cities are situated. Other mountain ranges are the Sierra de Neiba, the Sierra de Martín García, and the Sierra de Bahoruco in the southwestern part of the country. These geographical features will be discussed in more detail below.

The geology of the Republic has been described as relatively simple in its general outlines, but complicated in its details. The oldest rocks form a broad strip through the center and the younger rocks flank them on either side, but in the Cordillera Central and in the flanking areas frequent repetition of strata has resulted from

¹ See frontispiece.

block faulting. The complex structure and composition of the mountain ranges, and the wide variations in slopes and rainfall have contributed to produce many soil types. Geological formations must be briefly described because they are helpful in evaluating soils for agricultural purposes, especially in the absence of detailed soil surveys.²

The central cordillera. The great mountain backbone, the Cordillera Central, starts from low hills at the extreme east end of the island, rises gradually toward the west, and reaches its greatest height in the west-central part of the island. In the middle it expands to a width of about 80 miles, extending south from a point near Santiago.

The range appears to be a jumble of ridges and peaks with occasional unexpected beautiful little flat-bottom valleys nestling at their feet. The causes of these irregularities are to be sought in the complex geologic composition and structure of the Cordillera. Not only does the central mountain mass include many different kinds of rocks—effusive and intrusive igneous rocks, schists and other metamorphics, and a great variety of sedimentary rocks—each of which has its own characteristic topographic development, but much of it has been faulted along several different axes and otherwise disturbed.³

The west-central portion of the Cordillera Central has several lofty peaks, the highest of which is Pico Trujillo. The mountains are steep and the country in the vicinity is rough. Except for occasional small valleys, there is no arable agricultural land. Soils of the Cordillera Central are for the most part slightly alkaline and are usually shallow. They are probably below average in fertility, except in limited areas where soils have originated from some of the shales or are of limestone origin.

There are also areas of the red lateritic soils of serpentine origin, such as are found in both the neighboring islands, Puerto Rico and Cuba. These soils in the neighboring islands are high in iron content, running from 45 to 65 per cent iron oxide and in Cuba are being used for iron production. They are notably infertile, being deficient in phosphoric acid and to a lesser extent in potash and some

² See App. C for a discussion of mineral resources.

³ T. W. Vaughn and others, *A Geological Reconnaissance of the Dominican Republic* (Dominican Republic, 1921).

of the trace elements. Some of the areas along the foothills have been cultivated. Here the soil has been subjected to erosion, in some cases the fields previously cultivated being now but bare rock, supporting sparse weed coverings.

The Cordillera Central area contains a large part of the pine forests of the country. These forests extend east from the Haitian border to beyond the city of La Vega. In some cases the stands are thick and of commercial value, but at the lower elevations and in areas near highways they already have been cut over to a large extent and are no longer of much commercial importance. Natural reseedling is not rapid enough to keep pace with the cutting.

The northern cordillera. The Cordillera Septentrional, sometimes called the Monte Cristi range or the northern mountain system, starts as low rounded rocky hills near the city of Monte Cristi, extends southeastward for about 125 miles parallel to the north coast, and terminates near the shore of Escocesa Bay. The peaks in this range reach altitudes of 3,000 to 4,500 feet. The geological origins of the soils of this region are also complex, as there are considerable areas of limestone origin, others arising from shales, and still others of volcanic origin. The south front of this range is a fault scarp which has been considerably modified by erosion. One of its more prominent mountains is Monte Isabel de Torres at Puerto Plata, which rises steeply almost from the water's edge to an altitude 2,650 feet above sea level. There are a number of valleys in the range, but their areas are not large. In this region also, cultivation of the steep mountain sides has caused erosion of the rich surface soils in recent years.

The Sierra de Neiba. The Sierra de Neiba is a range of high mountains lying south of the Cordillera Central and separated from it by the San Juan Valley. It runs east and west, with the deep trough of the Enriquillo Basin to the south. It is composed chiefly of ridges of limestone ranging in altitude from 3,000 to almost 5,000 feet.

The Sierra de Martín García. The Sierra de Martín García is a short mountain range culminating in Monte Busú at an altitude of 4,360 feet above sea level. This range is almost an extension to the eastward of the Sierra de Neiba and is separated from it only by

the Río Yaque del Sur. It is composed in part of limestones similar to those of the Sierra de Neiba.

The Sierra de Bahoruco. South of and paralleling the Enriquillo Basin is a range of high mountains, the Sierra de Bahoruco, which come down to the sea near Barahona. Along the sea front this range of mountains is about 17 miles wide. The highest mountain in the range rises to slightly more than 6,500 feet. The north front of the range is composed chiefly of massive, steeply tilted, overturned and faulted limestone. The Cerros de Sal foothills, 500 to 650 feet high, west of Laguna del Rincón, consist of nearly vertical strata of rock salt, gypsum, shale, and sandstone. There are several fresh-water lakes in these mountains, fed by springs, at considerable elevations. Stands of pine trees cover the higher elevations.

The Samaná Peninsula. The Samaná Peninsula is a mass of fairly rugged but not very high mountains which in some localities are skirted by a narrow fringe of flat to rolling lowlands. Its average width from north to south is 7 or 8 miles. The west end of the peninsula is separated from the Cordillera Septentrional on the mainland by a flat swampy area, the Gran Estero, which in the not remote past was an open strait but which has now become closed, probably due in part to uplift of the land and in part to filling in with silt. The main mountain mass is divided into three parallel regions, the highest peaks of which rise to some 1,600 feet above sea level. In geological origin its soils resemble those of the Cordillera Central.

The Cibao Valley. The Cibao Valley extends from Monte Cristi and Manzanillo Bay, on the north coast, eastward to Samaná Bay, a distance of about 150 miles, ranging in width from 10 to 30 miles. In the vicinity of Santiago the valley is divided into two parts by a low hilly watershed, the western slope of which drains into the Río Yaque del Norte, flowing into Manzanillo Bay, while the eastern slope drains into the Río Yuna, which empties into Samaná Bay. The Cibao Valley at present is by far the richest section of the country from the standpoint of agricultural production. For the most part it is flat, although the western portion is gently rolling in places.

Irrigation is essential to agriculture in the western section of the valley, which is occupied by the broad delta and flood plain of the

Río Yaque del Norte. Between this low country and the foothills of the mountains to the south lies a strip of higher land dotted with gravelly knolls, which appear to be remnants of a former continuous sheet of gravel. The soil varies from gray to reddish-brown clay. The soils in general in the western end of the Cibao appear to be fertile, but the rainfall is sparse and the natural vegetation consists of thornbushes and cactus. One gains the impression that there are occasions in which the rainfall comes in heavy torrents, and that with sparse vegetation considerable sheet erosion takes place at times. Several large irrigation projects are in operation using the water from the Río Yaque del Norte.

The eastern part of the valley includes the fertile Vega Real and extends from the swamp lands, at the head of Samaná Bay, nearly to Santiago. The Vega Real is among the most fertile districts in the West Indies. The soil in the area immediately east of Santiago as far as La Gina and Las Cabullas is characteristically a friable gray clay loam up to 18 inches in thickness and underlain by a layer of friable dark-gray clay with some particles of limestone. It is evident that most of the valley was at one time submerged. Besides this extremely fertile district, there are other areas where fingers or ridges of yellow or yellowish-gray soils, some of them several miles in width, evidently of origin from the northern and central cordilleras, extend into the floor of the valley from both north and south. These have little or no depth of surface soils and are below the average in fertility.

The Valley of San Juan. The broad valley of San Juan is situated in the western part of the country between the Cordillera Central on the north and the Sierra de Neiba on the south. It is some 60 miles in length and from 10 to 12 miles in width. The valley consists of low hills, rolling plains, and large tracts of nearly level prairies. The soils are above average in fertility. The rainfall in this area is insufficient and poorly distributed, but numerous private as well as several large government irrigation systems make it possible to produce large quantities of rice, bananas, yuca, tobacco, and other crops. The uncultivated sections of the valley are covered with a typical thornbush vegetation consisting of bushes with sticky spines and several species of cacti.

The Enriquillo Basin. The Enriquillo Basin is a broad valley some 8 miles wide which, until recent geologic times, was a strait connecting Neiba Bay on the east with the Bay of Port-au-Prince, in Haiti, on the west. The Río Yaque del Sur, one of the largest rivers of Hispaniola, flows southward, emptying into the sea at the eastern end of Enriquillo Valley. This river rises from many branches in the Cordillera Central, the southern foothills of which are semi-arid and have a sparse vegetation consisting largely of cactus and thornbush. There is little or no grass covering, and when torrential rains fall there is great erosion and loss of soil into the Río Yaque del Sur. Geologists are of the opinion that it is the silt from this river that has built up a barrier across the eastern mouth of the Enriquillo Valley, shutting it off from the sea.

Records of water level in Lake Enriquillo support this viewpoint. In 1892 the surface of the lake stood approximately at sea level; in 1900 it was 110 feet below sea level; in 1921 it was 143 feet below sea level; and today it is about 163 feet below sea level. It is known, however, that the level of the lake rises and falls with variations in rainfall. The water in Lake Enriquillo is much saltier than sea water, owing its concentration in part to evaporation and in part to additions of saline matter carried by streams. The Laguna del Rincón is another body of water of considerable size lying in the Enriquillo Basin.

The soils in the upper margins of the Enriquillo Basin range from grayish-brown alluvial fine sandy loams to clay loams. The topsoils vary in depth from slightly more than a foot to a number of feet. The Río Yaque del Sur furnishes irrigation water for some 22,000 acres of sugar cane in this basin. Drainage ditches from the irrigated fields empty their water into Lake Enriquillo. Because of the relatively high salt content of the soil, special precautions against this hazard have to be employed.

The Southern Peninsula. Relatively little is known of the Southern Peninsula, a southern extension of the Barahona Province, because of its inaccessibility and aridity. The region is covered with forests and with thornbush vegetation. Much of the area is rough and of little potential importance agriculturally, but there are small pockets of fairly good soil. Although the entire area was not visited,

such pockets as were observed during the survey were surrounded by rocky outcrops making the usual agricultural methods impracticable.

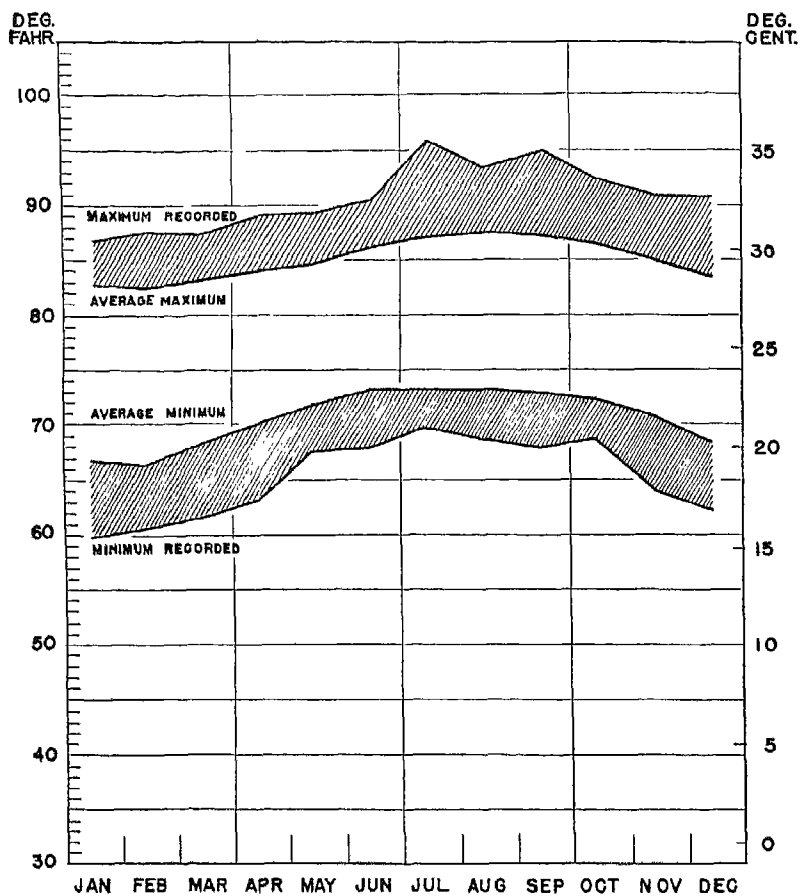
The coastal plain. The broad Caribbean coastal plain, which is the principal sugar-producing region, covers the southern portion of the District of Santo Domingo and the Provinces of Trujillo, Macorís, and the southern and eastern portions of the Province of Seibo. This plain, which consists of a series of terraces rising gradually from the shore to an altitude of 300 feet or more, lies at the southern and eastern edges of the foothills of the Cordillera Central. It increases in width from a few miles at the west end to a maximum of more than 40 miles in the vicinity of Higüey. The area in general, although characterized by the presence of limestone rocks, has much greater than average fertility. In some cases the bare limestones extrude through the soils. In other areas the rocks are broken up and, together with reddish or brown loams, form the topsoils. In places where channels have been cut by streams, flood plains of rich alluvial soil are found, but they are occasionally subjected to flooding from torrential rains. In some areas it is believed that considerable areas of land could be redeemed by drainage.

Because of its size, special mention is made of a broad level plain in the Province of Monseñor de Meriño in the vicinity of Bayaguana. The surface soil appears to be a sandy clay, yellowish to deep red in color, apparently of Cordillera Central origin, and not particularly fertile. Stones apparently of igneous derivation from 2 to 16 inches in diameter are found on the surface in many portions of this area. The soil is difficult to manipulate when either too wet or too dry.

II. CLIMATE

Temperature. The large ocean mass surrounding Hispaniola stabilizes its temperatures. From data obtained from the meteorology service of the Dominican Department of Agriculture, Industry, and Labor, graphs were prepared for a number of weather stations scattered throughout the island. Four typical examples, covering the more important agricultural areas and showing the

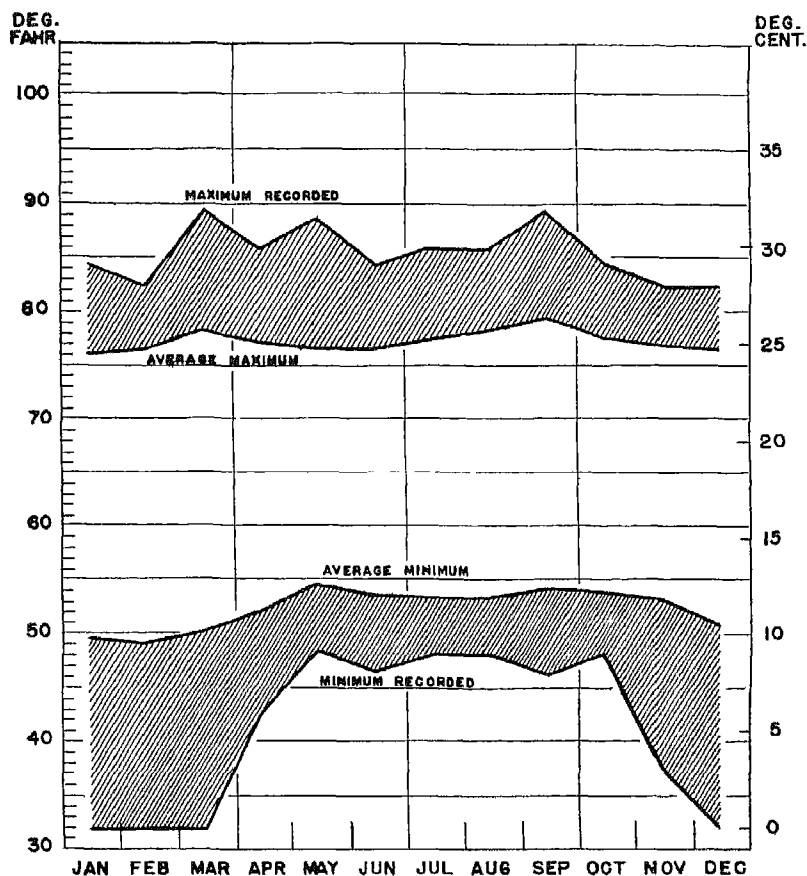
MAXIMUM AND MINIMUM TEMPERATURES RECORDED AT CIUDAD TRUJILLO^a



^a Elevation, 21.0 meters.

extreme conditions, are given above and on the three following pages. In the graphs the top and bottom lines show respectively the extreme maximum and minimum temperatures recorded during the period covered by the data; the inner lines show average maximum

MAXIMUM AND MINIMUM TEMPERATURES RECORDED AT CONSTANZA STATION^a



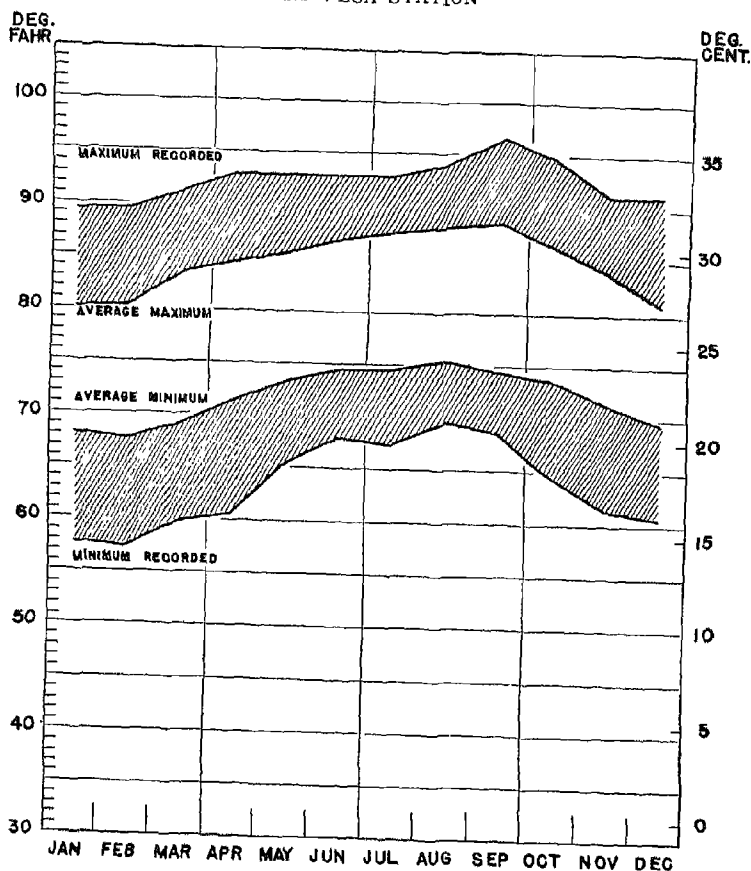
^a Elevation, 11900 meters.

and average minimum temperatures and hence the unshaded space between them shows average daily temperature ranges.⁴

The coolest weather at the stations shown, and at all others

⁴ Data for average maximum and minimum temperatures cover periods ranging from 4 to 10 years with an average of 7.6 years. Data for the maximum and minimum recorded temperatures cover periods ranging from 4 to 8 years with an average of 6.9 years. All data end Dec. 31, 1940.

MAXIMUM AND MINIMUM TEMPERATURES RECORDED AT LA VEGA STATION^a

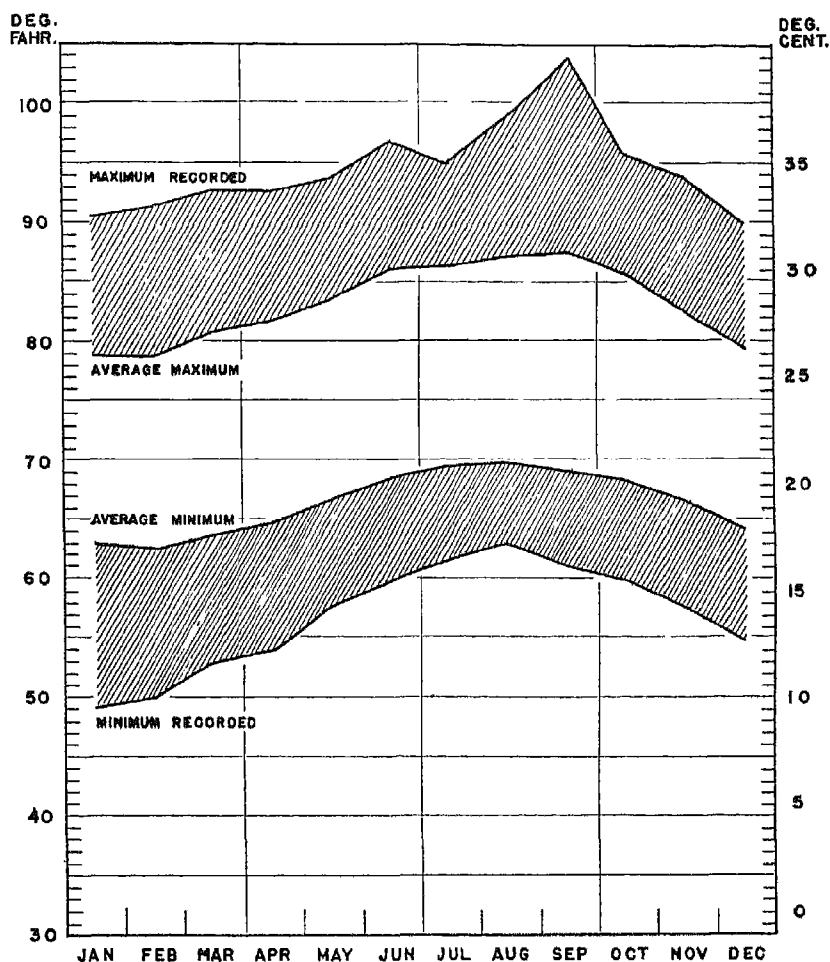


^a Elevation, 99.8 meters.

except one, has been recorded in January and February.⁵ Average maximum temperatures were highest for all stations in July, August, or September. The months of highest recorded temperatures varied more widely, but such differences have little significance.

⁵ Villa Rivas, near Samaná Bay, recorded both lowest minimum and lowest average minimum temperatures in March and April.

MAXIMUM AND MINIMUM TEMPERATURES RECORDED AT PUERIO PLATA STATION^a



^a Elevation, 85 meters.

Stations in the higher altitudes, of course, recorded generally lower temperatures than those on the seacoast and in the interior valleys.

Constanza, a station in a valley in the south-central part of the

Cordillera Central, at an elevation of about 3,870 feet above sea level (1,190 meters), had a maximum recorded temperature of only 89 degrees Fahrenheit, and an average maximum of only 79 degrees. Although the average minimum for January, February, and March at Constanza is almost 50 degrees, frost temperatures of 32 have been recorded.

The frost line in the Dominican Republic is at about 3,600 feet. In Ecuador, on the equator, frosts are not experienced under 7,000 to 8,000 feet. The low frost line is important because it affects the capacity of the Republic to produce certain crops which depend on high elevation for quality but are susceptible to frost. The cooler regions of the Republic may be suitable for certain temperate-climate fruits and vegetables, but such products do not always thrive in the tropics even at altitudes sufficient to insure relatively low temperatures. Many of them are not adapted to tropical lengths of day. In northern latitudes, although low temperatures are experienced in the winter months, the length of day is greatly increased in the summer. In the northern United States, for example, the sun rises at 4:00 A.M. and sets at 8:00 P.M., giving 16 hours of sunlight. In southern latitudes, as in the Dominican Republic, the day is not materially lengthened, the maximum being about 13.2 hours. Some temperate-country crops, consequently, do not get the hours of photosynthesis which they need, and frequently lack flavor and texture when grown at high elevations in the tropics. At high elevations in the tropics, moreover, periods of very warm weather are short or nonexistent, as at Constanza. At such temperatures growth is slow, and careful selection of varieties is required for success with many crops of this character. Another fact that may affect the cultivation of some temperate-climate plants is that there are high daily fluctuations in temperature in the mountains at the higher elevations. In general, at seacoast stations the daily and annual variations were within comparatively narrow limits.

Winds and hurricanes. The climate of the Dominican Republic owes much to the prevailing trade winds, which, during a large part of the year, blow from the northeast but veer at times to the east and southeast. Their normal velocities range from 5 to 30

miles per hour. These winds, absorbing and carrying moisture from the ocean, account for a large proportion of the annual rainfall. Blowing in from the cool waters of the Atlantic, they also temper the heat of the sun and the reflected heat from the land masses, and give the island its equable and relatively comfortable temperature.

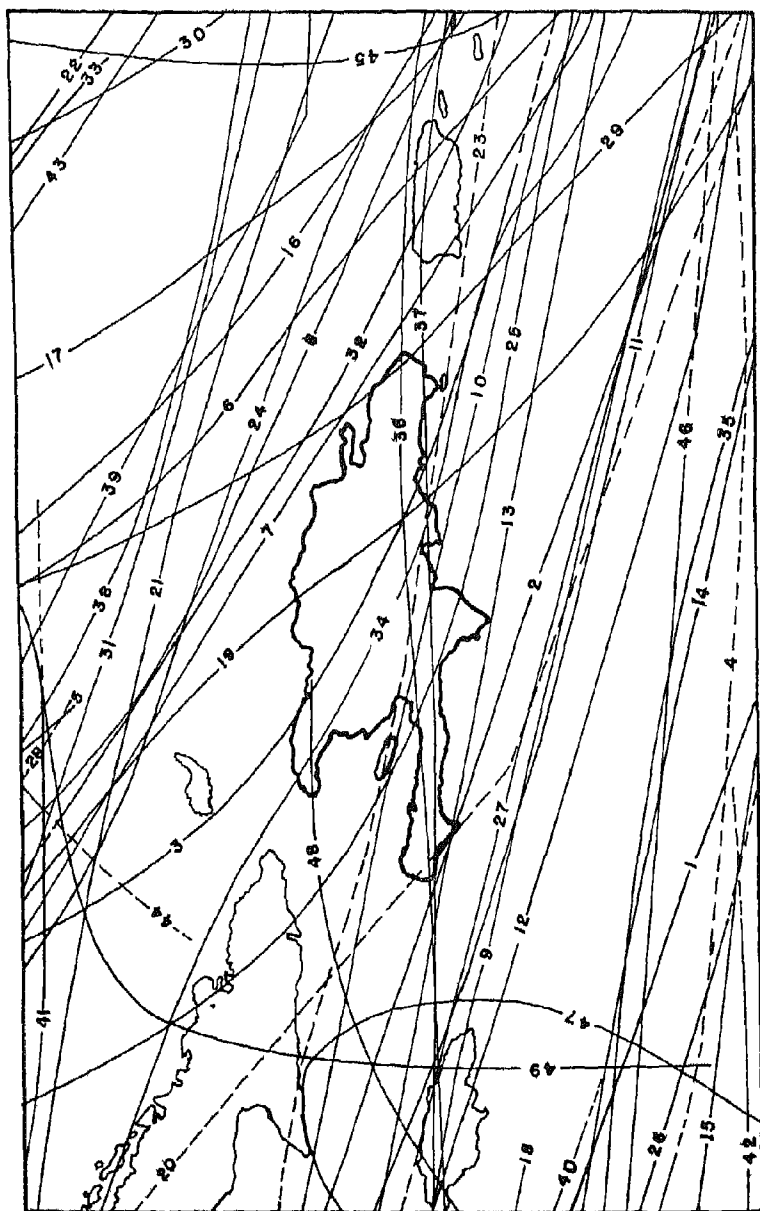
On the other hand, the Dominican Republic lies well within the area of tropical hurricanes. A chart presented on page 116 shows the paths of hurricanes in the vicinity of the country between 1900 and 1938. Numbers in the chart refer to the accompanying key, which gives the dates of the storms. During this period 13 hurricanes crossed the Island of Hispaniola and of these, 12 crossed parts of the Dominican Republic. One of these, however, was perhaps not of hurricane intensity.

Although the country has been struck, on the average, once in slightly more than three years, the damaging part of the storm path has usually been relatively narrow, and the actual areas affected have a much greater average number of years of freedom from storm damage. The north coast of the Dominican Republic and the Cibao Valley have had no hurricane damage in the years 1900 to 1940.

On the south coast the old City of Santo Domingo was struck directly by a hurricane in 1930, and a large part of the city was destroyed (see track 34 in the chart). The chart shows four other storms of hurricane velocity which passed over or near the city in the period 1900 to 1938, or a total of five hurricanes in 39 years. As seen in the chart, the south coast has been the area of greatest hurricane frequency. On the basis of available data, there is apparently a maximum hurricane expectation for any one part of the Republic of probably about one in eight years.

Barometric depressions, which are the cause of hurricane winds of high velocity, are usually accompanied by rainfall, which may extend 100 or more miles on either side of the track of the storm. Thus areas of low barometric pressure are not entirely a liability but bring rain to arid regions not reached by precipitation from the normal trade winds. The August, September, and early October rains of the south coast are apparently largely of this class. A comparison of the hurricane graph with rainfall graphs for Barahona,

HURRICANE STORM TRACKS, ISLAND OF HISPANIOLA AND VICINITY, 1900-38^a



^a Compiled from pilot charts of the Hydrographic Office of the U. S. Navy Department.

TRACK

TRACK

1	June 28 to July 6, 1933.	26	Sept. 24 to Sept. 26, 1914.
2	July 2 to July 10, 1901.	27	Sept. 21 to Sept. 29, 1917.
3	July 6 to July 10, 1901.	28	Sept. 7 to Sept. 14, 1919.
4	July 14 to July 22, 1909.	29	Sept. 6 to Sept. 17, 1921.
5	July 11 to July 14, 1916.	30	Sept. 14 to Sept. 27, 1922.
6	July 12 to July 20, 1916.	31	Sept. 6 to Sept. 22, 1926.
7	July 23 to July 28, 1926.	32	Sept. 6 to Sept. 20, 1928.
8	July 25 to Aug. 5, 1933.	33	Sept. 22 to Oct. 8, 1929.
9	Aug. 8 to Aug. 15, 1903.	34	Aug. 31 to Sept. 21, 1930.
10	Aug. 20 to Aug. 27, 1909.	35	Sept. 6 to Sept. 12, 1931.
11	Aug. 10 to Aug. 17, 1915.	36	Sept. 9 to Sept. 15, 1931.
12	Aug. 12 to Aug. 18, 1916.	37	Sept. 26 to Oct. 3, 1932.
13	Aug. 28 to Sept. 1, 1916.	38	Aug. 31 to Sept. 13, 1932.
14	Aug. 1 to Aug. 6, 1918.	39	Aug. 31 to Sept. 6, 1933.
15	Aug. 22 to Aug. 25, 1918.	40	Sept. 20 to Sept. 24, 1933.
16	Aug. 17 to Aug. 30, 1924.	41	Aug. 31 to Sept. 10, 1935.
17	Aug. 27 to Sept. 6, 1924.	42	Sept. 24 to Oct. 2, 1935.
18	Aug. 21 to Aug. 26, 1926.	43	Sept. 19 to Sept. 24, 1936.
19	Aug. 3 to Aug. 12, 1928.	44	Oct. 6 to Oct. 12, 1905.
20	Aug. 7 to Aug. 14, 1928.	45	Oct. 7 to Oct. 12, 1916.
21	Aug. 28 to Sept. 5, 1933.	46	Oct. 8 to Oct. 18, 1916.
22	Aug. 18 to Aug. 25, 1935.	47	Oct. 19 to Oct. 26, 1935.
23	Aug. 31 to Sept. 8, 1900.	48	Nov. 12 to Nov. 20, 1912.
24	Sept. 9 to Sept. 20, 1909.	49	Nov. 7 to Nov. 16, 1924.
25	Sept. 23 to Oct. 4, 1908.		

San José de Ocoa, Porvenir, La Romana, and other rain stations of the southern coast or slopes of the Republic shows that the curve of hurricane occurrences is almost congruous with the curve of August, September, and early October rains of this region.

Rainfall. Air moving from the ocean over the land is heavily laden with moisture. Any drop in temperature will tend to precipitate part of this moisture, while a rise in temperature will merely increase the capacity of the air to hold moisture. Consequently, as air meets the reduced temperatures of mountains, part of its moisture is precipitated on their windward slopes. In the valleys beyond mountains, temperatures are usually higher, so that precipitation ceases and a dry area exists. Further precipitation cannot be expected until this air is not only cooled but cooled below the temperature of the first mountain. A low coastal range may thus receive much heavier rainfall than a much higher interior range.

Large areas of green forests are said to favor precipitation because of the lowered air temperatures above them. Large areas of barren nonvegetated soils undoubtedly reflect more heat into the air and so lessen precipitation. There is reason to believe, therefore, that erosion, loss of vegetation, and drought may start a vicious cycle.

Air moving off warm bodies of water will be more heavily laden than air from cooler bodies. All of these factors in various combinations are effective in producing a complex rainfall distribution in the Dominican Republic with areas of high rainfall in some parts and deserts in others.

From an agricultural viewpoint not only the total and average quantities of rain are important but also the distribution of such rains and the length of the intervening dry periods. The extremely heavy downpours common to tropical areas often distort the average rainfall picture, as can be seen from the table on page 119, where biweekly rainfall totals of the La Vega weather station for 10 years are arranged in order of magnitude rather than in chronological order. Average rainfall is shown for each 14-day period, and heavy lines show the relative positions of the average rainfall for the period. It will be noted that in some cases, where extremely heavy rains occurred, as many as 8 years out of 10 showed precipitation below the average.

BIWEEKLY RAINFALL IN LA VEGA OVER A TEN-YEAR PERIOD

Biweekly Period	Inches of Rain from Year of Lowest Fall to Year of Greatest Fall (Figures to left of line are below average; figures to right, above average)												Ten-Year Average Rainfall
Jan. 1-Jan. 14.....	0.02	0.20	0.71	1.05	1.20	2.01	2.06	2.06	2.85	9.12	2.13		
Jan. 15-Jan. 28.....	0.08	0.12	0.43	0.81	0.86	1.04	2.16	3.62	4.12	8.54	2.18		
Jan. 29-Feb. 11.....	0.22	0.44	0.58	1.01	1.54	1.62	1.84	2.15	2.70	7.28	1.94		
Jan. 12-Feb. 25.....	0.00	0.12	0.37	0.43	0.48	0.87	1.02	1.36	1.60	2.04	0.83		
Feb. 26-Mar. 11.....	0.08	0.31	0.32	0.48	0.64	0.68	0.80	0.92	1.16	2.16	0.76		
Mar. 12-Mar. 25.....	0.00	0.00	0.31	1.77	1.97	2.57	3.24	3.46	3.52	5.03	2.19		
Mar. 26-Apr. 8.....	0.00	0.00	0.12	0.18	0.64	0.79	0.87	0.92	1.40	2.20	0.71		
Apr. 9-Apr. 22.....	0.00	0.39	0.92	1.30	1.40	2.10	2.72	2.76	3.33	8.38	2.33		
Apr. 23-May 6.....	0.28	0.43	1.97	2.10	2.32	2.65	2.85	6.86	9.19	11.24	3.99		
May 7-May 20.....	0.00	0.44	2.63	3.04	3.79	5.00	7.02	7.61	9.36	18.54	5.74		
May 21-June 3.....	0.44	0.67	0.96	3.02	3.19	4.30	5.12	5.49	5.90	7.12	3.62		
June 4-June 17.....	0.00	0.00	0.53	0.80	1.11	2.44	3.12	3.70	4.14	4.96	2.08		
June 18-July 1.....	0.00	0.00	0.36	0.83	1.32	2.01	2.23	2.85	4.12	5.69	1.94		
July 2-July 15.....	0.00	0.00	0.39	0.81	1.36	1.36	2.24	2.47	3.69	4.20	1.65		
July 16-July 29.....	1.10	1.12	1.31	1.71	1.90	2.04	2.67	3.18	4.46	5.21	2.47		
July 30-Aug. 12.....	0.16	0.40	0.45	1.21	1.29	1.35	2.00	2.64	2.75	4.60	1.68		
Aug. 13-Aug. 26.....	0.44	0.48	0.88	0.96	1.64	2.52	2.66	2.72	4.09	4.62	2.10		
Aug. 27-Sept. 9.....	0.00	0.00	0.68	0.68	0.85	1.00	1.01	1.60	1.97	2.46	1.02		
Sept. 10-Sept. 23.....	0.00	0.24	0.96	1.18	1.75	1.84	2.56	3.30	4.36	6.10	2.23		
Sept. 24-Oct. 7.....	0.89	1.00	1.16	1.64	2.59	2.66	4.83	5.40	5.60	8.67	3.44		
Oct. 8-Oct. 21.....	0.28	0.45	1.95	2.56	2.60	3.16	4.16	4.22	5.63	8.90	3.39		
Oct. 22-Nov. 4.....	1.24	1.28	1.43	1.92	2.08	3.24	3.60	6.10	6.40	12.83	4.01		
Nov. 5-Nov. 18.....	1.48	2.00	2.09	2.20	2.89	3.20	3.28	3.80	5.60	8.72	3.53		
Nov. 19-Dec. 2.....	0.00	0.84	1.10	1.16	1.52	3.40	3.53	4.17	4.58	9.75	3.00		
Dec. 3-Dec. 16.....	0.70	0.76	1.19	1.84	2.02	2.52	2.66	2.95	2.96	4.69	2.23		
Dec. 17-Dec. 31.....	0.00	0.16	0.20	1.04	1.44	2.61	3.96	4.27	5.22	6.53	2.54		

Graphs prepared for 20 representative rainfall stations, presented on pages 345-65, show the rainfall by averages for 14-day periods. Since, as indicated above, the rainfall averages do not offer a true picture of expectancy, a method has been developed to show actual rainfall over the years for which the averages were obtained. Above each rainfall bar graph are lines divided to indicate months and days. In the spaces for each day the recorded rainfall has been indicated, rains of 0.1 to 0.29 inch being shown as slanting lines and rains of 0.3 inch or over as solid blocks. With the bar graphs below, one visualizes the average rainfall distributed throughout the year, but no conception of the risks of drought are apparent. With the annual band charts above, one can appreciate drought expectancy even in the periods of the year when the bar graphs show favorable average rainfall.

The utilization of the charts may be indicated by that of Puerto Plata, on page 358, which is nearer to Sosua and more representative of climatic conditions than any other rain station for which records are available. The rainfall for this north-coast area, an average of 76 inches over a 10-year period as seen in the bar graph, would seem to be well distributed and adequate even for moisture-loving crops, with principal rainfall periods in October, November, December, and January, when the northeast trade winds are prevalent, and in April, May, and June. Yet, an examination of the annual band charts above shows frequent drought periods in this north-coast area in the months of June, July, August, and even September. Periods of 30 to 45 days with no rain or with but 0.3 inch of rain or less have not been uncommon in this period. The obvious conclusion is that drought-resistant crops must be selected for this region, or irrigation water must be available. The band chart also shows that there is a fair assurance of rain in the period October 15 to December 31, during which such drought-resistant crops can be planted and become well established. Expectancy of substantial rains for most years continues into January and February. There is another period in the latter part of April and May in which planting could be undertaken for the most drought-resistant crops. The rainfall graphs for Puerto Plata must not be considered as completely representative of Sosua, which is

some 14 miles east of the rain station and has much lower back country for the precipitation of rain. Sosua is probably definitely drier, but with a similar curve of rain distribution.

Throughout the Republic there is a period in the latter part of April and May when there is definitely a greater expectancy of rain. This April-May peak is just prior to the period during which the sun is directly overhead in its annual change in position northward in relation to the earth. It is possible that changes in temperature occur, bringing more water vapor into the air, which would account for this rainfall peak. In any case, it is of value to know of this greater expectancy of rain in these months in relation to planting programs. Rains in this period are much heavier on the south coast and in the Cibao than on the north coast, but a slight increase of rains at the north-coast rain stations has been recorded.

During the period July 2 to July 10 the sun is again directly overhead in Hispaniola, in its annual change in position southward. Although there seems to be a slight increase in rain in late July, the records are not sufficiently extensive for certainty. In nearby Puerto Rico, however, there is an increase in rainfall in late July and early August, and this rainfall peak then merges with the peak of rainfall associated with the period of frequent low-barometric pressures.

The second definite peak at south-coast stations in the Dominican Republic, in August, September, and early October, correlated with passing areas of low-barometric pressure, has already been commented upon in the discussion of hurricanes. This peak is not shown in rainfall charts for the north-coast stations and is not outstanding for most Cibao stations.

A third peak of rainfall expectation is experienced by north-coast stations such as Monte Cristi, Puerto Plata, and Samaná, and to a lesser extent by stations in the Cibao Valley, which is correlated with the period of the northeast trade winds, in November, December, and January. This rainfall associated with the northeast trade winds naturally is not shown on the graphs of rain stations on the south coast nor by those stations to the leeward of mountain ranges, such as Constanza. The expectancy of rainfall during January,

February, March, and early April is too low for planting even drought-resistant crops on the south coast, the lower levels of the Cordillera Central, and the upper and western Cibao. In these regions, the expectation of rainfall is generally best in the latter part of April and especially in May. On the southern coastal plain in the foothills of the Cordillera Central and in several sections of the lower or eastern Cibao, there is also fair probability of rain during the period of low barometers in September and October, probably sufficient for planting drought-resistant crops. In Santiago, the Monte Cristi Valley, and Puerto Plata, however, the charts give no confidence in the prospect of rains for this period.

The eastern end of the Republic, from Miches on the south side of Samaná Bay to Cape Engaño, the easternmost tip, apparently has unusually good rainfall, judged by the topography, river systems, and nature of the vegetation. There are no rain stations here. Some of the folds of the Cordillera Central fan out finger-wise in this section of the island, with peaks reaching 2,000 or more feet, and these elevations, all of which are wooded, apparently cause precipitation from the northeast trade winds as in the case of Samaná and Puerto Plata. There is also some reason to think that during the summer months, in the absence of pronounced trade winds, the warmer moisture-laden air currents of the Caribbean, meeting the colder air from the Atlantic, may cause some rain on the eastern coastal plains bordering Mona Passage. The region is traversed by numerous good-sized rivers and brooks of clear water, indicating good rainfall, and the flora consists of species that are not found in arid or semiarid climates.

Of the rain stations reported upon here, Samaná, with an annual average of 118 inches for a 10-year period, has the greatest rainfall, and Villa Rivas, with 93 inches, has a definitely wet climate. However, even Villa Rivas has had periods of extended drought, as shown in the band chart for this rain station. The Cordillera Central, at the highest elevations, may have areas of outstanding heavy rainfall, but no weather stations are available in this area. The volume of water in the Río Yaque del Sur and the Artibonito, which in their lower reaches flow through arid or semiarid regions, would indicate favorable rainfall in this Cordillera Central area.

III. RIVERS

There are four major river systems—the Yaque del Norte, Yaque del Sur, Yuna, and Artibonito—as well as a number of smaller streams which empty directly into the sea, draining the coastal plains.

The Yaque del Norte carries off the waters of the north watershed of the Cordillera Central and the south watershed of the Cordillera Septentrional, from a point in the Cibao Valley just east of the city of Santiago westward to where the river empties into the Atlantic Ocean near the city of Monte Cristi. The average annual rainfall in this watershed varies from 20 to 40 inches in the floor of the valley to 60 to 80 inches in the mountains.

The Río Yuna drains the eastern portion of the Cibao Valley from a point near the city of Santiago eastward to the Bay of Samaná, including the south watershed of the Cordillera Septentrional and the north watershed of the Cordillera Central. Rainfall in this drainage system is higher than that in the west end of the valley. The average varies from 50 to 95 inches annually in the floor of the valley to 100 inches or more in the mountains.

The Río Yaque del Sur drains a large part of the southwestern portion of the Republic. Arising on the south watershed of Pico Trujillo, one large branch passes through the large, relatively arid San Juan Valley. Another large branch, the Río de las Cuevas, arises on the southern slopes of Monte Tina, of about 7,000 feet elevation, and unites with the San Juan to form the Yaque del Sur. This then cuts between the two minor mountain ranges, Sierra de Neiba and Sierra de Martín García, and empties into the Bay of Neiba east of Enriquillo Basin. The average rainfall in the area drained by the Río Yaque del Sur varies from an estimated 100 inches or more per year in the highest peaks of the Cordillera Central to the large arid section of the San Juan Valley, where the average annual rainfall is probably below 20 inches.

The Río Artibonito is the longest river in the island and the one which has the greatest volume of water. It drains a large area of the western part of the Cordillera Central of the Dominican Republic and flows westward into Haiti. A considerable part of its watershed has an average annual rainfall of between 60 and 80

inches, and it is possible that even higher average annual rainfalls occur on some of the high peaks.

The coastal limestone plains are crossed by numerous relatively short but sometimes wide rivers which arise in the Cordillera Central, some of which provide water for small irrigation projects. Under these plains, runoffs of surface water have cut underground channels that are interconnected and form a network of underground runways. In general the level of the water in wells dug on these limestone coastal terraces is near sea level, and it is said to be approximately 11 inches higher for each half-mile inland from the sea.

CHAPTER VII

AGRICULTURAL DEVELOPMENT

Agriculture is the primary occupation of the Dominican people. The income derived directly from agriculture is something like 60 per cent of all income, and the farm population about 80 per cent of the total.¹ In addition, most of the industries are directly dependent upon agriculture. They include sugar mills, rice and coffee hulling establishments, the tapioca flour industry, chocolate factories, tobacco factories, distilleries, tanneries, and the vegetable oil industry, all of which process farm products. A large part of the transportation business is also devoted to the movement of farm products.

TOTAL AREA AND PERCENTAGE CULTIVATED, BY PROVINCES

Province	Total Area (Acres)	<i>Cultivated Area as Percentage of Total</i>
District of Santo Domingo.....	160,600	22
Azua.....	1,044,800	10
Barahona.....	1,679,600	8
Benefactor.....	1,326,400	9
Duarte.....	620,000	37
Españolat.....	222,300	43
La Vega.....	1,141,100	24
Libertador.....	437,200	4
Monte Cristi.....	923,800	12
Monseñor de Meriño.....	792,900	18
Puerto Plata.....	486,800	55
Samaná.....	224,800	17
San Pedro Macorís.....	264,300	58
Santiago.....	834,900	29
Seibo.....	1,674,700	18
Trujillo.....	533,500	25
Total.....	12,367,700	

The over-all area of the Dominican Republic is 19,324 square miles, or 12.4 million acres, more than half of which is not now utilized. The unutilized area consists largely of mountain slopes,

¹ See p. 229.

arid regions, and areas which are at present inaccessible. In the more than 7 million acres not included in the agricultural census, there are considerable areas of government-owned or unclaimed lands, and lands to which clear titles cannot be established. Of the 4.8 million acres covered by the 1940 agricultural census, according to preliminary data furnished by the National Statistics Office, about 2.5 million acres are planted to crops and cultivated pastures, approximately 1.7 millions are listed as wooded, and some 0.6 million acres are termed abandoned lands.

ACREAGES OF PRINCIPAL CROPS, BY PROVINCES, 1940^a
(In thousands of acres)

Province	Cacao	Coffee	Corn	Plan- tains	Po- tatoes, Sweet	Rice	Sugar Cane ^b	Yuca Edi- ble
District of Santo Domingo.	—	—	1	5	2	1	3	3
Azua.....	—	25	7	21	4	1	2	7
Barahona.....	—	22	4	17	4	3	22	2
Benefactor.....	—	7	15	60	7	8	7	14
Duarte.....	74	13	14	27	3	20	1	7
Españillat.....	15	22	11	16	7	—	—	5
La Vega.....	37	14	24	49	12	22	5	18
Libertador.....	—	1	2	2	1	1	1	2
Monte Cristi.....	—	1	4	4	3	9	1	5
Monseñor de Meriño.....	10	2	9	13	4	20	6	10
Puerto Plata.....	20	19	18	16	9	2	6	12
Samaná.....	5	1	2	3	—	4	—	1
San Pedro Macorís.....	—	—	3	3	2	4	90	3
Santiago.....	4	14	25	21	14	8	2	15
Seibo.....	20	4	22	30	4	16	70	12
Trujillo.....	3	20	21	18	4	10	10	13
Total.....	188	165	182	305	80	129	226	129

^a Compiled from preliminary data from the 1940 farm census furnished by the National Statistics Office.

^b Sugar-cane acreages are approximations and do not agree with official total for 1940 of 98,467 hectares, or about 243,000 acres.

For the Republic as a whole, slightly more than 20 per cent of the total area is listed as cultivated. The proportion of cultivated land varies from 4 per cent of the total area in the Province of Libertador to 58 per cent in the Province of San Pedro de Macorís. The table on page 125 shows the approximate areas of the various provinces and the percentages of the total area cultivated; the

table on page 126 shows the distribution of the principal crops among the provinces.

I. PRINCIPAL AGRICULTURAL PRODUCTS

Twelve crops constitute more than half the agricultural production of the Republic in terms of value, the crop of greatest value being plantains and bananas, with sugar cane second. Avocados, rice, cacao, and coffee are next in importance. The root crops—yuca, sweet potatoes, yams,² and yautias—and corn, which bulk large in the diet of the population, constitute a much larger part of the production when measured by volume rather than by price (see table below).

VOLUME OF PRODUCTION AND ACREAGE OF PRINCIPAL CROPS^a

Crop	Unit of Measurement	1939 Production	1940 Acreage
Avocados.....	Units	410,000,000	..
Bananas.....	Stems	14,700,000	71,900
Beans, dry.....	Pounds	43,000,000	50,700
Cacao.....	"	66,800,000	188,560
Coconuts.....	Units	24,600,000	...
Coffee.....	Pounds	66,400,000	164,787
Corn.....	"	166,000,000	181,800
Gandules, or pigeon peas.....	"	40,000,000	41,900
Sweet limes.....	Units	32,000,000	...
Mangos.....	"	560,000,000	...
Onions.....	Pounds	1,900,000	1,055
Oranges.....	Units	225,000,000	...
Peanuts.....	Pounds	9,565,000	10,660
Pineapples.....	Units	3,896,000	11,500
Plantains.....	"	461,000,000	305,100
Potatoes.....	Pounds	6,500,000	2,400
Potatoes, sweet.....	"	191,000,000	79,400
Rice.....	"	98,850,000	129,800
Rulos (second-grade bananas).....	Units	132,900,000	138,000
Sugar cane.....	Tons	2,798,432	243,213
Tobacco.....	Pounds	22,500,000	25,000
Yautias.....	"	76,000,000	37,600
Yuca, edible.....	"	189,000,000	129,000
Yuca, bitter.....	"	89,000,000	43,000

^a Compiled from preliminary data from the 1940 agricultural census.

² We use "yam" instead of the Spanish term *ñame*. It is not to be confused with the sweet potato.

A. Crops

The principal crops of the Dominican Republic in terms of estimated farm value for 1940 are as follows (in thousands of dollars):

Plantains and bananas	5,400
Sugar cane	5,000
Avocados	2,500
Rice	2,400
Cacao	2,300
Coffee	2,000
Yuca	1,500
Mangos	1,500
Dried beans and peas	1,400
Sweet potatoes	800
Corn	800
Oranges (sweet and bitter)	700
	26,300

Sugar cane. The principal crop from the standpoint of capital investment and value of exports is sugar cane. Fourteen sugar mills are in active operation. In the 1940-41 season, 243,213 acres of sugar cane, yielding 2,798,432 tons, were cut and ground in these mills. The table on page 129 gives more detailed statistics for 1938-39. The value of sugar exported in recent years has varied from 5 to 13 million dollars.

Most of the cane is grown under natural rainfall conditions, but several mills use some irrigation, and Central Barahona grows cane only under irrigation. Varieties of sugar cane used by the various centrals include BH 10 (12), P.O.J. 2878, P.O.J. 2725, Santa Cruz 12 (4), and Cristalina. Some of the companies are apparently alert to the advantages of utilizing the most modern field culture methods and the varieties best adapted to their particular environments. In general, however, considerable improvement could be made in yields by the improvement of agricultural methods and the planting of varieties better adapted to the various localities. Because of the low price of sugar in recent years, many fields that should have been plowed up and replanted have been ratooned longer than their productivity justifies.

Eleven of the active sugar mills are located on the broad limestone terraces along the south coast. Of the other three, Central Barahona produces all its sugar cane in the Enriquillo Basin, while the fields of Central Amistad and Central Monte Llano are located on the northern plains and on the slopes of the Cordillera Septentrional. In addition to the acreage that is cut and ground by the sugar companies, considerable acreage of sugar cane is found scat-

SUGAR CANE PRODUCTION, 1938-39^a

Central	Area of Cane Culti- vated (Acres)	Cane Produced per Acre (Short tons)	Sugar Produced per Ton of Cane (Pounds)	Total Sugar Pro- duced (Tons)	Molasses Produced (Gallons)
Romana.....	55,800	15.5	272	126,717	5,701,000
Consuelo.....	33,300	15.7	275	72,388	3,025,056
Santa Fe.....	28,000	15.8	264	49,576	2,771,949
Barahona.....	20,100	37.3	204	65,056	5,229,463
Quisqueya.....	18,100	17.1	247	36,924	2,199,130
Boca Chica.....	9,900	17.1	263	21,101	714,348
Las Pajas.....	9,700	18.1	271	21,986	751,338
Porvenir.....	9,200	11.7	274	14,769	698,920
Angelina.....	8,600	16.1	279	19,324	991,113
Italia.....	7,050	15.9	278	20,338	1,035,816
Cristóbal Colón.....	6,600	13.6	261	14,055	659,223
Monte Llano.....	4,560	16.0	246	11,273	297,215
Amistad.....	1,100	22.3	211	1,924	102,370
Ozama ^b.....	...	...	...	...	...

^a Based on *Anuario Estadístico de la República Dominicana*, 1939, Vol. 2, pp. 270-71. More recent detailed official data were not available.

^b Central Ozama began grinding in the 1939-40 crop and ground from slightly more than 5,000 acres.

tered in the interior. The product is used for cattle feed and for making a crude brown sugar.

The outstanding difficulty of the sugar industry is the extreme uncertainty of its markets. Little Dominican sugar is sold in the United States. In recent years most of it has gone to England, where it must compete with the subsidized sugar industries of the British dominions and colonies. Competitive advantages of the industry are the availability of fertile and cheap soils and the relatively low wage scales.

Coffee. Cultivation of coffee probably started in the Republic about the middle of the eighteenth century and for many years it

has been one of the important exports (see accompanying table).

The agricultural census of 1940 gives the area planted to coffee as about 165,000 acres, with a production in 1939 of 66.4 million pounds. Coffee is usually regarded as a crop which grows best at altitudes of from 1,000 to 5,000 feet, and it is believed by some that the best grades are produced at the higher altitudes. A considerable proportion of the Dominican coffee is produced in the mountains, but there is also some cultivation in the lowlands, especially in the Cibao Valley. Other principal coffee-growing areas of the Dominican Republic are found in the Batoruco mountains in

COFFEE EXPORTS, 1930-39^a

Year	Amount (In thousands of pounds)	Value (In thousands of dollars)
1930.....	10,664	1,483
1931.....	11,282	1,183
1932.....	14,108	1,255
1933.....	25,956	1,820
1934.....	21,104	1,677
1935.....	19,631	1,267
1936.....	32,025	2,018
1937.....	24,230	1,764
1938.....	18,467	1,039
1939.....	31,079	1,731

^a *Anuario Estadístico*, 1938, Vol. 2, p. 349; 1939, Vol. 2, p. 282.

Barahona Province, in the Provinces of Azua and Trujillo, in the mountains bordering the Cibao in the Provinces of Santiago, La Vega, Espaillat, and Duarte, and on the north coast in the Province of Puerto Plata.

Cacao. The Dominican Republic produces about 2.8 per cent of the world's supply of cacao and ranks sixth among countries producing this commodity. The amount exported over a ten-year period is shown in the table on page 131. The agricultural census gives the 1939 production as 66.8 million pounds. Of this amount about 5 per cent is consumed locally, and approximately 90 per cent is exported to the United States. Cacao from the Dominican Republic is quoted in the trade figures as "Sanchez," an ordinary grade of the product.

In 1940 the census listed slightly more than 188,000 acres of cacao in the Republic. Of this acreage more than two-thirds is found in the Cibao Valley, the remaining production coming principally from the Provinces of Barahona, Samaná, Monseñor de Meriño, Seibo, Trujillo, and Puerto Plata.

CACAO EXPORTS, 1930-39^a

Year	Amount (In thousands of pounds)	Value (In thousands of dollars)
1930.....	45,542	2,710
1931.....	56,355	1,789
1932.....	43,720	1,027
1933.....	38,194	1,274
1934.....	50,347	1,738
1935.....	62,352	2,097
1936.....	39,934	1,605
1937.....	43,155	2,524
1938.....	62,405	1,915
1939.....	61,758	2,014

^a *Anuario Estadístico*, 1938, Vol. 2, p. 205; 1939, Vol. 2, p. 283.

Rice. Production of rice in the Dominican Republic increased from 7,480,000 pounds in 1927 to 90,435,000 pounds in 1939. Imports, which in 1927 amounted to 68,026,000 pounds, were

RICE PRODUCTION, 1927-39^a

Year	Production of Milled Rice (In thousands of pounds)
1927.....	7,480
1928.....	13,090
1929.....	16,500
1930.....	24,860
1931.....	39,820
1932.....	40,367
1933.....	59,352
1934.....	63,800
1935.....	70,400
1936.....	76,369
1937.....	80,027
1938.....	91,805
1939.....	90,435

^a Adapted from U. S. Department of Agriculture, *Foreign Crops and Markets*, Aug. 4, 1941, p. 122.

steadily reduced, and in 1940 a small amount was exported.¹ This change was brought about by governmental development of irrigation projects, coupled with imposition of successively higher import duties which in 1939 reached 2.7 cents a pound. Some irrigation projects in the vicinity of Valverde (Mao) are utilized almost entirely for rice irrigation. This is also true to a large extent of several projects in the vicinity of Azua and San Juan. On the other hand, considerable acreages of rice are grown under dry-land conditions, especially in the vicinity of Bayaguana and Monte Plata and in the Provinces of Seibo and La Vega. The acreage listed in the 1940 census is 129,800.

Plantains. Plantains, which might be called "cooking bananas," are one of the chief food sources in tropical countries. In the Dominican Republic they are produced in large quantities and constitute one of the standard items of the daily diet. Home gardens frequently have one or more stools of this plant, and the markets handle large quantities. The 1939 production of plantains is listed as 461 million fruits. Since only a small percentage of this fruit is exported, consumption must average nearly 300 plantains per person per year. According to the census, 305,100 acres of plantains were grown in 1940. The large plantings are found in the Provinces of Benefactor, La Vega, Azua, Santiago, Seibo, Trujillo, Duarte, and Espaillat.

Bananas. The culture of bananas has fluctuated. Foreign companies have attempted intensive culture in the past. It is understood that a new development under irrigation is being made and that within a short time large-scale production will again be undertaken. In spite of the fact that no large companies are operating at present, there is considerable production, with weekly shipments in 1941 of from 3,000 to 9,000 stems being made to the United States. Bananas are also used locally as food. The agricultural census shows a production of 14.7 million stems in 1939, and the 1940 acreage was listed as 71,900. Heaviest production is in the Cibao, the

¹ See discussion on p. 217.

San Juan and Azua Valleys, and the Enriquillo Basin, with considerable amounts in the Provinces of Trujillo and Seibo.

In addition to the acreage listed above for bananas, the census shows a large acreage and production of "rulos" ordinarily regarded as a second-grade banana.

Edible yuca. This is another tropical crop which is a source of food starch and for this reason is widely cultivated. In addition, a commercial establishment began the manufacture of yuca starch about ten years ago and the market thus established for the roots has promoted cultivation of this crop.

YUCA STARCH EXPORTS, 1930-39^a

Year	Quantity (Short tons)	Value (Dollars)
1930.....	17	1,333
1931.....	793	33,986
1932.....	1,392	51,243
1933.....	1,546	41,982
1934.....	3,409	154,126
1935.....	1,692	84,111
1937.....	3,362	196,643
1938.....	1,178	64,197
1939.....	12,608 ^b	620,854

^a *Anuario Estadístico*, 1939, Vol. 2, p. 205.

^b This represents export of accumulated stocks rather than any marked increase in production.

The 1939 production of edible yuca in the Dominican Republic is given as 189 million pounds. The 1940 area devoted to this crop was 129,000 acres.

Coconuts. The 1939 production of coconuts is given as 24.6 million nuts. The more important producing areas are the Enriquillo Basin, the Samaná Peninsula and nearby Samaná Bay areas, the Province of Trujillo, and the Cibao Valley. The production and exporting of copra and the exporting of ripe nuts have not been developed to any large extent. During the year 1939, copra and nuts amounting to 250,000 pounds were exported. The balance of the crop is consumed locally either green or ripe.

Tree fruits. The Dominican Republic produces annually large quantities of tree fruits of various kinds that are utilized as fresh

food. Avocados, mangos, oranges, and limes are found widely distributed. For the most part only ordinary varieties are grown. The large centers of production are the Cibao and the coastal plains of the south and north coasts. No important commercial use is made of these fruits for preserves or other prepared products.

It is understood that a number of years ago a sizeable planting of limes was made on the north coast, but because of a lack of shipping facilities the project was unsuccessful.

The table on page 127 presents the reported production of various fruits for the year 1939.

Pineapples. Although no important exportations of pineapples are made from the Republic, considerable quantities are produced and consumed locally. In addition to the consumption of pineapples as raw fruit, a considerable quantity is used in the production of wine. The two varieties, "Pan de Azúcar" and "Francesa" or "La Cayena," are the most popular and widely grown. The principal production areas are the Cibao in the vicinity of Santiago and in the Province of Seibo near Higüey. In 1939, the production was reported as 3.9 million pineapples. In 1940, an acreage of 11,500 was listed as planted to this crop.

Corn. A considerable acreage of corn is grown in the Dominican Republic. In 1938, exports of shelled corn amounted to 27.8 million pounds, the major portion of which went to the United States. In 1939 more than 31 million pounds were exported, none of which went to the continental United States. The principal countries of destination were Venezuela, Dutch West Indies, Netherlands, Puerto Rico, and the French West Indies, in the order named.

The 1939 production is given as 166 million pounds and the 1940 acreage is reported as 181,800. No special varieties of corn are planted and the fields cultivated are all small in size. The most important production areas are the Cibao and the Provinces of Seibo and Puerto Plata.

Tobacco. Tobacco produced in the Dominican Republic and sold in the world market was formerly purchased almost entirely by European countries, including Holland, Belgium, Germany, and France. The cured tobacco leaf is usually brownish black, and quite strong, probably owing to the variety used and to the method of

curing. Tobacco leaves are harvested and immediately hung up in thatch-covered sheds with no sides, where they remain until the leaves are bagged for the market. While tobacco is planted throughout the Republic, by far the major production comes from the Cibao. In 1939 the total production of tobacco was recorded as

TOBACCO EXPORTS^a

Year	Quantity (Thousands of pounds)	Value (Dollars)
1930.....	28,534	1,032,000
1935.....	15,257	292,611
1939.....	19,171	422,263

^a Data are from *Sumario de Comercio*.

22.5 million pounds. In 1940 the area devoted to tobacco culture was listed as 25,000 acres.

Peanuts. During the past few years, an increase in peanut culture has taken place, largely as the result of the establishment of a peanut-oil plant. This plant partly fills a long-felt need for the local production of edible vegetable oils.

The 1939 peanut production is reported as about 9.5 million pounds, and the 1940 acreage as 10,660. The principal production areas are the Cibao, and the Provinces of Seibo, Trujillo, Libertador, and Benefactor.

Vegetables and minor crops. Sweet potatoes, dried beans, gaudules, potatoes, and onions are among the most important vegeta-

EXPORTS OF DRIED BEANS, 1930-39^a

Year	Quantity (In thousands of pounds)
1930.....	1,902
1931.....	1,796
1932.....	801
1933.....	582
1934.....	650
1935.....	697
1936.....	660
1937.....	612
1938.....	521
1939.....	247

^a *Anuario Estadístico*, 1938, Vol. 2, p. 206; 1939, Vol. 2, p. 277.

bles produced. Practically all of these are produced by small growers scattered over the Republic. The principal production area is the Cibao Valley. The Provinces of Seibo, Azua, Benefactor, and Barahona also produce dry beans, which have been exported in considerable quantities, as shown in the table on page 135.

The production in 1939 and the acreage reported for 1940 for the important vegetables are shown in the table on page 127. The area devoted to peas, sesame, cotton, yams, horse beans, chick peas, tomatoes, and eggplant was reported to be 37,000 acres. The production of bitter yuca in 1939 was 89 million pounds, and the area planted in 1940 was reported as 43,000 acres.

B. Animal Industries

A considerable part of the arable land of the Republic is utilized for pasture. The agricultural census lists a total of 910,000 acres planted to grass, of which Guinea and Páez grasses are the most important. In many sections of the Republic it appears that arable land is being used for grazing purposes when insufficient land is available for cropping. It seems possible that the use of some of the slopes for grazing and more of the flat lands for cropping might be helpful to the agricultural economy of the Republic as well as helpful in the control of soil erosion and the conservation of the forest resources.

The 1940 agricultural census listed the livestock population as 804,000 cattle, 782,000 hogs, 243,000 horses, 48,000 mules, 115,000 burros, 469,000 goats, and 37,000 sheep.

Although some attention has been given to breeds, it would appear that much more can be done, especially in improving dairy cattle, mules, and hogs. Milk production is low, and the cows in general do not have the best attention. Mules are small and are not well fed. Most of the hogs run wild in the wooded areas, and little attention is paid to commercial pork production.

The daily egg production is 894,000, and some 221,000 chickens are marketed monthly. With regard to health, much of the poultry compares favorably with that of neighboring islands. The chickens are small, as are the eggs. Chickens are not usually given special feed, and little has been done to improve breeds.

C. Forestry

The entire island of Hispaniola was probably wooded when first discovered by the Europeans. Since its discovery the forests have been cut faster than nature has been able to replace them, and little or nothing has been done in the way of reforestation or aiding natural replanting. At the present time, much of the accessible hardwood timber has been cut, and the logging of pine is going forward at a more rapid rate than the natural receding (see Chapter IX). The value of the timber exported in 1938 and 1939 is given in the table below.

TIMBER EXPORTS, 1938, 1939^a

Type	1938	1939
Logwood.....	\$ 1,023	\$ 16
Lignum vitae.....	39,637	46,747
Bastard lignum vitae.....	19,409	13,037
Mahogany.....	30,626	11,190
Railroad ties, posts, and other	21,850	28,087

^a Dominican Customs Receivership, *Report of the 33rd Fiscal Period... 1939* (1940), pp. 101-02.

Pine forests, according to figures of Dr. Carlos E. Chardón, who wrote a preliminary report on the forest resources of the Dominican Republic in 1937, comprise some 7,200 square kilometers (2,780 square miles) in the Cordillera Central and some 300 square kilometers (116 square miles) in the Sierra Bahoruco. These pine forests in many areas are almost pure stands of *Pinus occidentalis*. This species is native to Hispaniola, probably having extended its southern range when in past geological times Cuba and Hispaniola were joined. The pine trees are found at elevations of 500 feet to 10,000 feet above sea level. They extend over a rather wide range of soils and environmental conditions. Scattered among them are frequent stands of hardwoods and sometimes of palms. Any calculations on the total area of available pine forests would need to take these into account, and the net amount might be about half of the total area mentioned by Chardón. There are some 20 sawmills in the Republic. Mill operators pay a tax of five dollars per thousand board feet for all lumber cut.

VI. The irrigation projects are divided into eight districts, as indicated in the accompanying table.

The Villa Isabel Irrigation District is supplied by a canal carrying 5,500 liters per second. The water is obtained from the Yaque del Norte in a location called Juan Gómez, in the commune of Guayubín. Fields totaling 7,410 acres planted almost entirely

IRRIGATION DISTRICTS IN THE DOMINICAN REPUBLIC^a

Irrigation District	Number of Canals		Delivery of Water (Liters per second)	Acres Irrigated	Predominant Crops
	Government	Private			
Villa Isabel	1	—	5,500	7,410	Rice
Valverde (Mao) . . .	1	1	5,700	7,100	Rice and bananas
Santiago	1	3	2,600	1,735 ^b	Rice
Baní	2	40	2,000+	2,850 ^c	Plantains, beans, peanuts, rice, onions
Azua	2	68	...	5,295	Rice, potatoes, onions, and plantains
San Juan	1	44	1,500+	10,000	Potatoes, onions, peanuts, rice, beans
South	3	71	22,250+	40,000	Minor fruits, rice, sugar cane, plantains
West	2	8	3,000	3,000	Rice and minor fruits
Total	13	235	42,550+	77,390	

^a Compiled from data made available by the Secretaría de Estado de Agricultura, Industria y Trabajo.

^b Does not include the Canal General José Estrella now under construction, planned to irrigate approximately 9,000 acres.

^c The Nizao-Baní Canal, now under construction in this district, will have a capacity of 5,500 liters per second and is planned to irrigate 13,500 acres.

to rice are serviced by a canal 9.08 kilometers in length with 46 kilometers of laterals. This irrigation canal was constructed by the government, using a power dragline. No private irrigation projects of any size exist in this district.

The Valverde (Mao) Irrigation District of 6,175 acres is supplied by a government canal 20 kilometers in length and supplying 4,500 liters per second. Under construction are various laterals to increase the area served by this canal. The canal itself was constructed by a power dragline and obtains its water from Río Mao near the town of Valverde (Mao). In this district also a private canal of the Bogaert estate takes water from the same river and

carries 1,200 liters per second, irrigating 925 acres. The irrigation waters of this district are also utilized to a large extent for the production of rice and several minor crops.

The Santiago Irrigation District will be supplied by a large canal called the "General José Estrella," now under construction. It is designed to have a length of 43 kilometers and to provide 6,500 liters per second, and when completed will be one of the larger irrigation canals in the Republic. In this district the Compañía Agrícola Dominicana, C. por A., has under cultivation 85 acres of rice irrigated with a canal carrying 200 liters per second of water taken from the Río Yaque del Norte. In addition, the firm J. Armando Bermúdez has a canal carrying 1,900 liters per second and providing irrigation water for 1,400 acres of rice, bananas, and plantains. One additional smaller irrigation project of Eusebio Pons operates a canal of 500 liters per second capacity and provides irrigation water for 250 acres planted mostly to rice. All of these canals obtain their water from the Río Yaque del Norte.

In the Baní Irrigation District the government has under construction the Nizao-Baní canal designed to have a capacity of 5,500 liters per second to irrigate 13,500 acres and operates Canal Ramfis with a capacity of 2,000 liters per second, irrigating 1,850 acres. In the same area there are some 40 small private irrigation projects which provide water for about 1,000 acres.

In the Azua Irrigation District, which embraces all of the Province of Azua, 5,295 acres are under irrigation, of which 700 acres are supplied with water from the Estebanía and Las Charcas canals constructed by the government. Water from artesian wells is used to irrigate 1,900 acres. The remaining irrigated area is supplied by numerous small private projects. Water is supplied by the Río Yaque del Sur and by a number of small rivers flowing in the direction of Puerto Viejo. A large number of wells, mostly artesian, are soon to be dug near Puerto Viejo. It is hoped to bring under irrigation some 3,000 acres.

In the San Juan Irrigation District, a large zone is supplied with water from the San Juan canal constructed by the government and taking water from the Río San Juan. This canal has a capacity of 1,500 liters per second and supplies water for about 2,500 acres.

The main ditch of this canal is about 13 kilometers long. In this district also are 44 small private irrigation systems supplying a total of 7,500 acres.

The South Irrigation District is supplied by the Barahona irrigation canal, which has a capacity of 21,750 liters per second, and is the largest in the Republic. Its main ditch, 22 kilometers in length, supplies water to some 21,000 acres, and secondary ditches have a total length of 101 kilometers. In the same commune of Barahona there are three other private irrigation projects covering an area of 2,200 acres. In the commune of Duvergé the government constructed two small canals for the irrigation of slightly more than 800 acres. In addition, there are in this commune 26 small irrigation projects embracing nearly 6,000 acres that are planted to various fruit and small vegetable crops. In the commune of Neiba the government has constructed a small irrigation project taking water from Río Panzo, having a capacity of 500 liters per second, and supplying water to more than 1,200 acres. In addition, 41 small projects supply water to 8,700 acres of land planted to various fruits.

In the West Irrigation District there are two small government-built canals, the Matayaya canal with a capacity of 1,000 liters per second, and the Llano canal with a capacity of 2,000 liters per second. At present these canals supply water for some 1,400 acres. Eight small private projects provide water for nearly 1,700 acres.

It is understood that a large banana company is planning to develop pump irrigation, using the sprinkler system, on an extensive acreage on the south side of the Río Yaque del Norte, near Monte Cristi. The Dominican government is also contemplating one or two large projects on the north side of the same river.

B. Underground Water Resources

The underground water resources vary greatly in the various geological regions. Along the Río Yaque del Norte, underlying strata in the vicinity of the river make pump irrigation feasible. The eastern half of the Cibao Valley does not appear to be so constituted. Most attempts to find water-bearing gravel layers there have been failures, and little or no irrigation from wells is carried on. Several

artesian wells occur in the Yaque del Sur drainage area, but little or no irrigation water is obtained from wells by pumping.

Along the south coast in the vicinity of Ocoa Bay still a different condition exists. The waters of the rivers gradually disappear when their courses encounter the gravelly soil layers underlying the surface soil. There are apparently, however, additional layers of gravel lying at relatively shallow depths from which the water lost from the rivers can be pumped. A number of fairly extensive pump irrigation projects are in operation or are contemplated for this particular area.

The surface run-offs of water on the limestone coastal plain have cut underground channels throughout the entire shelves, which are interconnected and form a network of underground runways. In general the level of the water in wells dug on these limestone coastal terraces is near sea level, but increases approximately one foot for each half-mile inland. This is probably the result of the head of water maintained by drainage from inland areas. It may be possible to obtain water for pump irrigation in this region, and, as a potential means of increasing the amount of arable land, this possibility should receive careful consideration. If the water level in wells near the sea is materially reduced, sea water undoubtedly will come in.

C. Land Tenure

The preamble of the Land Registration Act of 1920 stated:

It is a matter of public knowledge that land titles in Santo Domingo are in general so confused and uncertain as to handicap the development of the country, foster fraud and blackmail on a wholesale scale, and result in unjust deprivation of rightful owners of their land, thus provoking disorder and breaches of the peace, and tending to loss of confidence in the State.

This situation arose chiefly from the existence of the so-called *terrenos comuneros*. From colonial times, it was customary, when a tract of land was inherited by several heirs, or when portions of it were sold, to assign shares in the tract as a whole instead of making a physical division. This was useful in many cases where the need for access to water or to transportation facilities made it desirable to keep the property intact, but it caused much confusion. The shares

were referred to as "peso titles," because they represented a claim to a stated part of the value of the land in terms of money. Since the holder of such a title could in turn bequeath or sell it, in whole or in part, it became difficult after several generations to determine the ownership of the tract as a whole. The situation was further complicated by the fact that many records had been burned or lost, and by frequent instances of fraud or despoliation.

The Land Registration Act set up a Land Court to grant titles to be registered in the offices of the Dirección General de Mensuras Catastrales. The court has made substantial progress, and has now awarded titles to lands covering approximately one-third of the area of the Republic. There still remain extensive areas where rightful legal title has not been established, including areas adjacent to the capital, in the Cibao Valley, in the Vega Real, and in other productive regions. In some instances, supposedly rightful owners who were in possession of the land have found it less expensive to buy the land again from contesting claimants than to take the case to the courts. Most of the productive land not legally cleared is in the *terrenos comuneros* class.

Large tracts of the most fertile land are held by absentee ownership, resulting in relatively unproductive forms of exploitation, such as leasing land for charcoal production or for pastures, because these uses require little owner supervision. The existence of large, inefficiently utilized tracts has been one of the factors that have forced the growing farm population to expand into the hills, where the cutting of forests to make *comucos* or small gardens is causing a disastrous loss of topsoils by erosion.

D. Agricultural Credit

The agricultural credit facilities available to growers may be grouped under two headings: (1) credit extended by individuals; and (2) credit extended by banks or trading companies. Credit extended by individuals takes a wide variety of forms. It may cover purchases of land or equipment; costs of land preparation, seeding, cultivation, or harvesting; or it may be a loan on the harvested crop to permit the growers to hold it for a more favorable market.

A common type of credit is the loan extended by a processor,

such as a rice huller, to a grower. The security required by private credit agencies ranges from mere personal promises to a mortgage on real estate, goods, or the crop. Credit extended by private individuals is the most usual type available to agriculture. Losses by creditors due to crop failure or falling prices are common, and interest rates are high, sometimes exceeding 2 per cent per month in the case of small planters.

Agricultural credit extended by banks or trading houses may be divided into sugar-cane loans and other loans. In the case of the former, sugar companies may advance money at times to growers, secured by liens on the cane crop. Sugar companies borrow at times to cover their own crop production or other operations, and such loans are secured by liens on the property.

Non-mortgage bank credit averaged about \$1,723,000 in 1940, a fair proportion of which can be properly classified as agricultural in the commercial banking sense. Credit to agriculture is in the form of secured loans, largely confined to marketing, processing, and domestic and export distribution. Occasionally bank credit, when well secured, goes beyond such operations and into the producer field. Somewhat more gets into this area indirectly through bank advances to the export and trading companies. Many small farmers, planters, and other agriculturists without banking credit status have no access to organized credit, inasmuch as they cannot satisfy the requirements of the ordinary commercial bank. The establishment of other agricultural credit agencies will be difficult while land titles are insecure.

E. Agricultural Labor

Agricultural labor is chiefly of local origin. Sugar cane, cacao, and coffee are the only crops which require large numbers of workers at certain seasons and no labor at others. The harvesting of cacao and coffee usually presents no major difficulty, though there have been times when it was not possible to obtain sufficient help to gather the coffee crop in certain sections. The sugar-cane crop requires a large amount of labor at harvest time to cut the cane, load carts, and work in the mill, the greatest demand being for cane cutters. This work is not popular with Dominican labor, and in

years past the sugar companies have relied principally on Haitian cane cutters.

A law concerning the employment of foreign labor, dated December 23, 1938, provides that 70 per cent of all personnel in a given establishment must consist of Dominican citizens, but that special permission may be obtained for a one-year period to bring in foreign common laborers, who must be returned to their homeland. At least one sugar company brings in and returns each year more than 1,000 Haitian sugar-cane cutters under this provision. There are also numerous instances in which individuals enter the country of their own accord and remain to work, though the head tax of \$6.00 per year on foreigners living in the Republic deters the immigration of laborers to work at the prevailing low wages. The usual wage throughout the Republic for unskilled farm hands is between 25 and 35 cents per day. Experienced workers in the sugar-cane fields or in other specialized crops may receive as much as 50 cents per day for short periods.

It is interesting to compare this wage standard with that in certain other tropical countries.⁴ In neighboring Haiti, the government pays a daily wage of 20 cents for highway construction, and large agricultural enterprises pay the same. Wage scales in some parts of Mexico are comparable to those of Haiti. In Ecuador the government pays 20 cents a day for labor on highway construction, although there are regions of congested population where as little as 15 cents per day is paid for the same work. Wage scales in Brazil are comparable to those in Ecuador.

In the Far East, even lower wages are paid. In Java the equivalent of 11 cents per day is paid for labor on sugar plantations, and many women and children are employed at wages of 6 to 8 cents per day. Labor in Sumatra and the Malay Peninsula is slightly

⁴ Comparisons of wage scales between various tropical countries in this discussion are based upon minimum daily wages for field labor in the sugar industry for which certain operations are directly comparable in all countries. In countries in which sugar is not an important crop the figures are based upon wages paid for manual labor in highway construction. Figures for sugar-cane labor are taken from reports of the U. S. Tariff Commission and from interviews with administrators of sugar enterprises in the various countries. Figures for labor in highway construction are taken from bureaus of public works and from contractors.

more expensive, but in many parts of China wages are even lower.

On the other hand, there are many tropical countries where wages are higher. In some parts of Central and South America (including Venezuela, Colombia, Panama, Costa Rica, Nicaragua, and Salvador) wage scales higher than those in the Dominican Republic have become established because of the standards introduced by fruit, shipping, mining, and petroleum companies, largely North American. The British West Indian colonies in general pay the equivalent of from 40 to 60 cents in United States money per day for agricultural labor, depending on the value of the British pound sterling. Cuba has a minimum wage of \$1.00 (United States currency) for agricultural labor in the sugar industry. United States possessions, such as Puerto Rico and the Virgin Islands, pay \$1.00 to \$1.20 as a basic wage for sugar-cane or road construction labor. Hawaii pays a much higher wage scale, well above \$2.00 a day, as a basic wage in sugar-cane plantations. In the Philippines 40 to 50 cents per day is a representative wage for sugar-cane labor.

These comparative labor costs are important in considering the production of crops for export. The Republic will be at a disadvantage in growing crops which are now well established and raised under favorable climatic conditions in countries with lower labor costs, although the war situation may open up temporary opportunities to supply products formerly coming from the Far East. On the other hand, with a careful selection of crops adapted to the environment and to particular soils, the Republic can compete with many countries where costs are higher. Agricultural research to improve varieties and increase yields and a study of markets can be extremely important in this connection.

CHAPTER VIII

POSSIBILITIES OF INCREASING AGRICULTURAL PRODUCTION

The preceding chapter has been concerned with the development of agriculture in the Dominican Republic up to the present time. In the light of this development and of what is known about the agricultural resources of the island, we may now turn to the possibilities of increasing agricultural output. Consideration will be given both to the subsistence crops and to special agricultural products intended for the export market.

I. SUBSISTENCE CROPS¹

The Dominican farmer lives close to a subsistence level. The average per capita income of the farm population, including the value of goods raised and consumed on the farms, is estimated at approximately \$32. Only about \$14 of this, or \$84 per family of six persons, is in cash. With this small sum the farmer must purchase the few farm implements he may require, buy wire to repair fences, pay interest on the advance he may have received from the local rice-hulling or coffee-hulling plant, and clothe himself and his family. He has little money to buy foodstuffs which he cannot grow on his own farm. Crop failure may mean acute distress. It is clear that an increase in agricultural production and a better distribution of farm products is essential to the welfare of the Republic.

First consideration must be devoted to providing an adequate diet. We have not been able to make dietary studies, but there is some evidence to indicate that, while the people in general may be fairly well supplied with carbohydrates, proteins, and fats, there are deficiencies in the vitamins. Any agricultural policy for the Republic as a whole should therefore emphasize the increased production of truck and fruit crops, and especially those such as chayotes, calabazas, plantains, yams, malangas, yautias, and pigeon peas,

¹ See also Chap. 18.

which are indigenous to the country and have been grown there for years.

There are also several introduced crops which should be given consideration. Cabbage grows well in the tropics if sprayed for control of the cabbage moth. So also do Chinese cabbage, or pechay, which will produce fresh greens month after month, and some varieties of soy beans. A sweet corn adapted to the tropics has been developed by the United States Department of Agriculture.

The crops mentioned above are of course only a few of those which should be studied for possible introduction into the Republic. Carrots, parsnips, and turnips grow well in the tropics if the climate is not too dry. Tomatoes, cucumbers, peppers, and melons can be produced to good advantage in semiarid regions, where fungus diseases can be more easily controlled, provided irrigation is available. Among the fruit crops, papayas, mangos, pineapples, bananas, plantains, avocados, cashews, limes, guavas, sapotes, and sapodillas can be grown in drier regions, while oranges, grapefruit, mangosteens, guanabanas, and breadfruit need a well-distributed rainfall or irrigation.

The bark of trees of the cinchona species is generally considered by the trade to have a higher quinine content when grown at high elevations. This factor would probably preclude the production of cinchona for export because the Dominican Republic is so far north of the Equator that the trees could not be grown more than 3,000 feet above sea level without danger of frost.

It would be quite desirable, however, to develop a cheap source of quinine for people of low income in those areas of the Republic where malaria is prevalent. In the Philippines cinchona has been grown, but instead of extracting the purified quinine a product consisting of all the alkaloids of the cinchona bark, *totoquin*, is administered directly for malaria therapeutics. It is possible that the powdered bark of the cinchona tree, prepared in large quantities, homogenized, and carefully controlled as to the chemical content of quinine and alkaloids, could be used in the Dominican Republic for direct dosage with great savings in cost of production, thus making this relief from several tropical fevers widely available.

Areas for experiments in cinchona production should be selected at the highest elevations, free from frost liability, well-protected from even ordinary trade winds, in areas of well-distributed but not excessive rainfall, where the soils are loose and well aerated. Several of the cinchona species are highly susceptible to three or four fungus diseases, which may be partly or entirely avoided by careful choice of the areas of production.

II. PRODUCTS FOR EXPORT

While the first task of the Dominican farmer is to provide an adequate food supply, general improvement in the nation's standard of living will also require an increased production of commodities that can be sold abroad. The natural market for most of the Republic's products will be the United States. The tariff and quota restrictions which bar Dominican sugar from the American market are not an obstacle in the case of many other commodities which might be grown successfully in the Republic. Sisal, hides, rubber, copra, palm nuts, papain, cassava flour, crude spices, and many essential oils such as citronella, lemon grass, and ylang-ylang now come into the United States free of duty. There are many other products on which customs duties have been lowered by recent reciprocal trade agreements, including castor beans, honey, fresh coconuts, fresh pineapples, limes and lime juice, figs, guava paste, cattle, swine, pork, bacon, poultry and poultry products, milk, and some classes of cheese. The opportunities for the development of some of these products which are duty-free, or for which the duty has been substantially lowered, are briefly discussed in the following paragraphs.

Arrowroot. The arrowroot plant (*Maranta arundinacea*) is native to the West Indies. It produces a flour of a finer texture than that of other starchy plants, the use of which has been increasing for the manufacture of packaged ice cream mixes and puddings. United States Department of Commerce figures show consumption in the United States from 1937 to 1940 of from 5 to 8 million pounds per year, valued at \$300,000 to \$460,000. Arrowroot is well adapted for production in parts of the Republic with adequate rainfall and loose soils.

Bananas. The production of bananas in irrigated, semiarid areas of the Republic may be favored by the absence of Sigatoka, a fungus disease of bananas, which takes its name from a locality in the Fiji Islands in which the trouble was first noted and described. This disease has spread to a number of the Caribbean countries. The causal fungus is a *Cercospora*, related to the fungus species which cause similar diseases on sugar cane, corn, and several other crops. Infection is favored by moisture on the leaves for long periods of time. In areas of heavy rainfall or in fields so situated that the moisture from dew persists on the leaves for many hours of each day, infections become so numerous as seriously to decrease actively functioning leaf areas and even to cause heart rot in the most severe cases. In the Hawaiian Islands, where a closely related fungus attacked sugar cane in an identical way, it was found that in semiarid localities, where moisture on the leaves from either rain or dew was of short duration, infections were so few as to be of little commercial importance.

It seems reasonable to suppose, therefore, that if banana cultivation were transferred from humid areas to zones of semiarid climate in which moisture is supplied by ditch irrigation, the disease could be held in check much more cheaply than could be done by spraying operations. The Dominican Republic has considerable areas in which such environmental conditions exist, and extension of banana production in such areas seems logical.

Because of the well-organized transportation and marketing arrangements of the large fruit companies, banana growers in most Western Hemisphere countries are a privileged group having a comparatively higher income than other agricultural producers. In 1935 and 1936 the United States imported bananas valued at 27 to 30 million dollars. In 1941 there were in the Republic several buyers of bananas for export to the United States, and weekly shipments from all ports have reached at times as high as 15,000 to 18,000 stems. The agricultural census shows a production of 14.7 million stems in 1939.

The only variety exported is the Gros Michel. Plantings are most extensive in the Cibao, the San Juan and Azua Valleys, and

in the Enriquillo Basin, but there are scattered plantings producing fruit for export in most of the provinces. One of the large fruit companies of the United States has recently purchased 75,000 acres east of Monte Cristi for which irrigation will be developed and upon which banana production will be undertaken.

Plantains. The plantain is resistant to the Sigatoka disease which attacks bananas and can therefore be grown in regions of greater rainfall where irrigation is not necessary. The value of plantains imported into the United States in 1935 and 1936 varied between \$162,000 and \$179,000, apparently largely for use by the Latin-American colony in New York. There is, in addition, an increasing market in Puerto Rico.

Citrons. In the past citrons have come from Mediterranean countries. There has been a considerable importation into the United States, duty-free, from Italy, southern France, Palestine, and Greece. These imports varied from 2,200,000 to 3,200,000 pounds in the years 1937 to 1940, valued at \$101,000 to \$173,000. With regard to labor costs, the Dominican Republic can compete with these countries and perhaps it also has some climatic advantages. Citron trees (*Citrus medica*) are well adapted to the environment of many of its hillside lands at low elevations. It is probable that in areas of well-distributed rainfall they could be grown without irrigation. There would seem to be good profit possibilities for individual growers as well as a slight increase in annual income to the Republic from the production of this crop.

Cacao. In the Dominican Republic cacao has natural advantages. Cacao trees (*Theobroma cacao*) are believed to be native to Central America, and the related species (*Theobroma leiocarpa*), which enters much more widely into commerce, is believed to be native to the Amazon Valley. *T. cacao* beans produce chocolate of a higher quality than *T. leiocarpa*, but there has been apparently much natural hybridizing so that pure strains of *T. cacao* are probably not produced commercially over any extensive areas.

Both cacao species are now subject to two devastating fungus diseases, one a fruit rot and the second, probably even more destructive, known as witch's broom. Previous to their outbreak in Ecuador about 1918-20, that country produced about 75 per cent of the

world's consumption of chocolate; in the last few years Ecuador has not produced 5 per cent of the consumption of the United States alone. These two fungus diseases do not occur in the islands of the Greater Antilles. Investigators who have specialized in studies of the diseases are of the opinion that the lower temperatures which prevail during the winters in the northern Antilles will prevent them from becoming destructive there.

Cacao is at present the second item of export from the Republic, and it would seem that its production might be increased. The crop has great capacity to withstand excessive soil moisture and grows in heavy soils, and its production could be extended in the heavy moist soils of the lower eastern Cibao. It is a good crop to check erosion on hillside land and could be extended on both slopes of the northern range and over large extensions of land in the eastern hills of the Cordillera Central.

The profits from cacao might be considerably improved by research resulting in strains of high production per individual tree with richer flavoring of fruit, such strains being then capable of vegetative reproduction. An improvement in the present methods of processing might easily result in a product of higher quality and a lowering of costs.

Coffee. Although coffee prices are now maintained at favorable levels, such prices are artificial, resulting from the restrictions adopted by Western Hemisphere producing countries. Moreover, the coffee trade is convinced that to be of the best quality, coffee should be grown at elevations high above sea level. There are countries nearer the equator than the Dominican Republic and having large areas 5,000 to 8,000 feet above sea level. Coffee from these areas brings the highest prices in the New York market. It is therefore doubtful whether coffee plantings in the Dominican Republic should be expanded at this time, except perhaps in the mountainous country of the interior, at the highest elevations possible without encountering frost liability. Attention could advantageously be given to new varieties of Arabian coffee, which are much more productive than the present West Indian strain and cannot be distinguished from them in quality as determined by cup tests. Better methods of preparing coffee might also be intro-

duced. It should be noted that there has always been a market at fair prices for good grades of coffee even when the trade was most depressed.

Fiber crops. The war has created a great shortage of certain fiber crops, but their production offers many difficulties. Manila hemp, for example, which was formerly obtained almost entirely from the Philippines, requires large areas of land and more rainfall than is usual in most parts of the Dominican Republic. In the case of sisal the possibilities seem greater in spite of the fact that sisal is produced in Haiti and Mexico, where laborers receive the equivalent of 20 cents per day, and in Sumatra and British East Africa, where wages are even lower. During the years 1934 to 1939 the Republic used from 3,850 to 6,600 tons of jute bags annually for the marketing of sugar, cacao, and coffee. Jute imports ranged in value from \$368,000 to \$642,000. In Ecuador, Colombia, Costa Rica, and El Salvador sisal or similar agave fibers are used for bag manufacture. Such bags are stiffer than jute bags and stevedores dislike to use them because the hard fibers cut their hands and shoulders; however, sisal bags are stronger and more durable than those made of jute. Colombia has a high import tax on jute and other bag fibers which practically excludes the use of jute bags. The possibility of developing a similar industry in the Dominican Republic is discussed in Appendix C.

Rubber. The prospect for profitable rubber production seems doubtful. Labor on rubber plantations in the Far East receives in some places as little as 11 cents (United States currency), per day, and in times of low prices small native planters make the equivalent of a daily wage that is even less. From 40 to 60 per cent of the cost of producing rubber is expenditure for labor. The Dominican Republic has no known climate or soil advantages for rubber production. It should be noted that rubber is apparently being grown successfully in Haiti, where labor costs are lower.

Coconuts and copra. Some regions are well adapted to production of coconuts and copra. The United States, in a reciprocal trade agreement with the United Kingdom effective January 1, 1939, lowered the import duty on fresh coconuts from one-half to one-quarter cent each. This reduction, under the "most favored nation"

clause, is applicable to coconuts from the Dominican Republic. The United States market for approximately 50 million coconuts, with an annual value of about three-fourths of a million dollars, is thus made more accessible.

Copra enters the United States free of import duty. In 1936 imports were 232,126 short tons, with a value of almost 10 million dollars, and in 1937 imports were 200,000 tons, with a value of more than 12 million dollars. United States imports come largely from the Philippines, where wages for agricultural labor are 30 to 50 cents (United States currency) per day, and from Ceylon, where wages are slightly lower. The Dominican Republic can compete with such labor, and has an advantage in its shorter freight haul to the eastern United States.

Coconuts have considerable capacity to withstand drought, and extension of this crop in many areas along the seacoast and into the interior would be possible. One of the chief obstacles to the development of the coconut industry in the past has been a scale insect (*Aspidiotus destructor*) which is widespread in the Republic. Myriads of these, sucking the tree saps, reduce the size and weight of the fruit and the yield per acre. The United States Department of Agriculture, however, has introduced into Puerto Rico a predaceous insect, a coccinellid (*Azya trinitatis*), that feeds upon the scale insect on the coconut leaves and controls them. This insect was made available to the Secretariat of Agriculture of the Dominican Republic and is already established in several localities, removing one of the chief obstacles to the development of the coconut industry.

Essential oils. Anise, bergamot, camphor, caraway, cassia, cinnamon, citronella, lemon grass, lime neroli or orange flower, origanum, pettigrain, thyme, and ylang-ylang, essential oils of tropical or subtropical origin, enter the United States without import taxes. In addition, in a reciprocal trade agreement concluded with France in 1936, import duties on oil of cloves, patchouli, sandalwood, and all others not specifically provided for, which under the Tariff Act of 1930 were subject to a duty in the United States of 25 per cent ad valorem, were reduced to 12½ per cent ad valorem. In a similar trade agreement with the Netherlands in 1936, import taxes

on cajeput oil were similarly reduced, from 25 to 12½ per cent ad valorem. These reductions in tariffs apply also to the Dominican Republic.

These oils are produced for the most part in southern Europe, northern Africa, Ceylon, the Philippines, Dutch East Indies, and islands of the Indian Ocean. Few are produced at present in the Western Hemisphere. The total value of all essential oils imported into the United States probably has not amounted to 10 million dollars annually in recent years, but their production offers possibilities at times like the present when normal sources of supply are cut off. Although the impression is usually held that essential oils are valuable only for perfumes and cosmetics, some of them, such as citronella oil, from which menthol can be manufactured, enter into the manufacture of drugs. They are also important in soap manufacture, and are used in insecticides and to obscure disagreeable odors in various products. They are, therefore, more important to the economy of the Western Hemisphere than is generally appreciated. It would seem that possibilities of such crops as citronella and lemon grass, and possibly cajeput, cassia, and clove oils might warrant experimentation in certain areas of the Republic, although the prospects are not bright.²

Papain. The preparation and export of papain, which contains the proteolytic enzyme of the papaya and is used as a therapeutic to aid digestion, merits study. Papain as now imported into the United States is the dried latex of the papaya (*Carica papaya*) often mixed with dried leaves and other foreign matter. Ceylon is the principal source of supply at the present time. Consumption in the United States in the past years has been about 225,000 pounds annually, valued at approximately \$250,000.

Enzyme chemists state that in the drying of papaya latex there is considerable coagulation and destruction of the enzyme papain, and that the latex would be more valuable if collected more carefully, freed of detritus, and dried only to the consistency of a paste rather than to hard pieces of coagulum.

Studies of the collection of the latex and its preparation and

²For further discussion of citronella and lemon-grass oils, see Chap. 18 and App. B.

shipment as a paste would be advisable. The papaya is particularly well adapted for production as a hillside crop in parts of the Republic with well-aerated soils and well-distributed but not excessive rainfall. It can withstand drought.

Spices. Several spice crops are well adapted to Dominican conditions. Cinnamon and black and white pepper are produced in low-labor-cost countries of the Far East and competition with them appears difficult, but nutmegs, mace, cloves, allspice, and ginger are produced in countries with slightly higher wage scales than the Dominican Republic. Of these crops, all but ginger are adapted for hillside cultivation.

Of these crops, allspice merits an additional note. It is native to the West Indies and is at present produced in Jamaica. Within recent years a fungus disease, a true rust that causes material damage, has developed in that country. The disease does not yet occur in the Dominican Republic. There are several regions of hillside land on the northern slopes of the Cordillera Septentrional which are well adapted for production of this crop. Should it be undertaken, both national and local quarantine procedures to prevent the entry of the allspice rust would be necessary.

Castor beans. Between 1935 and 1938 the United States imported from 77,000,000 to 164,000,000 pounds of castor beans valued at from \$1,700,000 to \$3,644,000. The greater part came from Brazil. Prices have risen in recent years because of the development of a process by which castor oil can be substituted for tung and other quick-drying oils in paint manufacture. Tung oil from China is still preferred by the manufacturers, but the impossibility of obtaining this in sufficient quantities has made it necessary to turn to substitutes.

Castor-bean plants grow well in many parts of the Dominican Republic. In the richer soils the plants reach a height of 12 to 15 feet, making harvesting difficult and expensive. Plants on such rich soils also have a tendency to go to heavy vegetative growth with sparse production of beans. For these reasons sandy, less fertile soils are preferred to the heavy, fertile, limestone soils widespread in many parts of the Republic. Castor-bean plants have great capacity to withstand drought.

Castor-bean production has advantages in that the initial cost of seeding is small, no fertilizers are needed, and the crop comes into production in but a few months. It is a crop that can be started or discontinued quickly. Farmers who plant it should remember, however, that it is likely to be far less profitable after the present war is over.

Pineapples. There are export possibilities for fresh pineapples. The Dominican Republic produces two excellent varieties. These are entirely distinct from the varieties shipped commercially from Puerto Rico and Cuba, which now supply the United States market.

Fresh pineapples from Cuba and Puerto Rico for the northern markets are usually picked green and permitted to ripen while en route to or in the markets, with the result that in juiciness and flavor they cannot compare with field-ripened pineapples. In recent years the United States Department of Agriculture has completed experiments showing that field-ripened pineapples can be successfully shipped from the northern tropics to New York in cold storage. The possibility of commercial shipments would of course depend on the continued availability of cold storage space in steamers serving the Republic's ports.

Limes. Lime trees grow well without irrigation and have a considerable capacity to withstand drought. They avoid certain fungus diseases almost completely when grown in a fairly dry environment. Furthermore, they are well adapted for hillside cultivation. They would thus be a good crop for considerable areas of the Republic, especially, perhaps, for the limestone foothills of parts of the northern slopes of the Cordillera Septentrional.

There are several improved varieties, but the large consumers of the North seem to prefer the small green seedling lime of the West Indies, which commands a good market and is easy to ship. The United States imported 9,824,000 pounds of fresh limes in 1936, and 11,638,000 pounds in 1937, valued at \$274,000 and \$318,000 respectively. Most of these imports now come from Mexico, although a small proportion originate in the British West Indies. In its reciprocal trade agreement with the United Kingdom, effective in 1939, the United States reduced import taxes on limes from 2 to 1½ cents per pound.

The production and marketing of limes is an industry which would seem to favor the careful grower and shipper. Here again, however, success would depend on the availability of suitable transportation.

Animal products. Puerto Rico affords a good market for animal products, especially since the recent growth of military establishments there has taxed the island's food-producing capacity. Moreover, with a shortage of shipping, a system of priorities has had to be adopted on freight from the continental United States. The supply of a number of foodstuffs from the Dominican Republic would be a definite factor in relieving the temporary shortage of ocean freight space.

In its reciprocity treaty with Canada, in 1939, the United States lowered the import taxes on cattle weighing less than 200 pounds from $2\frac{1}{2}$ to $1\frac{1}{2}$ cents per pound. The import tax on swine was lowered from 2 cents to 1 cent per pound; on fresh or chilled pork, but not frozen, from $2\frac{1}{2}$ to $1\frac{1}{4}$ cents; on bacon, hams, and shoulders, from $3\frac{1}{4}$ to 2 cents per pound. The import tax on whole milk, fresh or sour, was reduced from $6\frac{1}{2}$ to $3\frac{1}{4}$ cents per gallon; on Cheddar cheese, unprocessed, from 7 to 4 cents per pound. On live chickens, ducks, and geese the import taxes were reduced from 5 cents to 4 cents per pound, and on eggs from 10 to 5 cents per dozen. Many of the provisions of the reciprocity treaty of the United States with Canada would seem to be particularly adapted for the trade of the Dominican Republic with Puerto Rico.

It would seem advisable for the Dominican government to give increased attention to the improvement of cattle, swine, and poultry breeds. These industries have opportunities for expansion at this time. One way in which the quality of the product could be improved would be the provision of more adequate feed.

The pigeon pea (*Cajanus indicus*), which is high in protein content, has been a great success in the Hawaiian Islands, not only for pasturing dairy animals but also in producing beef cattle. The use of leguminous shade trees in pastures, some of which produce beans of high protein content, is another cheap practice to contribute to good alimentation of beef, hogs, and goats. Such beans fall to the ground and are picked up immediately by the pastured animals

and may produce a high protein diet for as long as two or three months. Trees which are immediately available are the rain tree (*Pithecolobium saman*), madre de cacao (*Glyricidia sepium*), and guamá (*Inga inga*) for climates of moderate rainfall (60 to 90 inches per annum), while the algarroba (*Prosopis juliflora*), widespread throughout the tropics, is well adapted to regions with possibly as little as 30 inches of rain annually. The production of the soybean varieties used for cattle forage in the tropics may also prove extremely useful.

The use of some varieties of sugar cane after it has been passed through an ensilage cutter, and of molasses mixed with cut grasses, is one way to get cheap carbohydrate concentrates for dairy animals in the tropics.

Some of the beef and poultry breeds adapted to the tropics of other countries could be advantageously imported for trial in the Dominican Republic. Two breeds of beef cattle in Colombia are well adapted to the stronger sunlight and heat of the tropics. For work animals, the Santa Gertrudis of Texas, and of course the Indian zebu and crosses of the zebu with Western Hemisphere breeds of work animals, merit consideration. In Barbados there is a breed of goats which has been more successful in the Virgin Islands than the breeds imported from the North. In the Philippines a breed of poultry for combined egg-laying and dressed fowls, known as the Cantonese, has been developed.

CHAPTER IX

FOREST AND SOIL CONSERVATION

The problem of forest and soil conservation is so important as to require special consideration in any study of present economic conditions and future economic possibilities in the Dominican Republic. In a country where the bulk of the national income derives from agriculture, the soil is a priceless asset. What will happen if it is not conserved may be seen in other countries such as China, the Holy Land, and more recently in nearby Haiti and parts of the United States, where deforestation and erosion have caused impoverishment.

I. THE NEED FOR CONSERVATION

In the Dominican Republic erosion is at present only in its incipient stages, and very extensive losses of rich soils have not yet occurred. Nevertheless, lumbering without reforestation and the clearing and burning over of hillside lands are now creating conditions that require urgent consideration. Erosion in the Republic results chiefly from the runoff of rainfall in large volume and at high velocity, and it can be decreased by any practice that will reduce the volume and velocity of runoff water.

An experiment conducted by the Soil Conservation Service of the United States Department of Agriculture at Mayaguez, Puerto Rico, showed the value of vegetative coverings to the soil in reducing the volume and velocity of runoff water. In this experiment, the soil loss from erosion and the amount of runoff water were measured on each of 22 plats of identical soil type and degree of slope. Some of the plats were covered with grass coverings, some with various crops, while others were left bare without vegetation. The bare, nonvegetated plats, following rains of an inch or more in an afternoon, recorded a volume of runoff water 25 to 30 times greater than the vegetated plats.

These experimental results have three outstanding practical applications. (1) They indicate that vegetative coverings are one of the most effective and cheapest ways of cutting down volume of

runoff water and thus minimizing soil erosion. (2) They indicate that deforestation, burning over, and destruction of vegetative coverings on hillside and mountain lands will increase the volume of runoff water and so increase the peak of freshets and floodwater, resulting in greater destruction of public works such as culverts, bridges, highways, dams, and reservoirs. (3) They show that there will be far less storage of water falling on barren hillsides. This in turn means decreased flow of springs, brooks, and rivers in dry periods. These conclusions are particularly significant for the Dominican Republic, dependent as it is upon agriculture for its prosperity, and upon irrigation for the extension of its arable lands.

Any normal tree sends its roots 4, 6, 8 or more feet into the subsoil, where they absorb nutrients such as phosphoric acid and potash, essential for the tree's development. These nutrients are carried through the roots, trunk, and branches of the trees to the leaves. On maturity the leaves fall to the ground and eventually decay and gradually become incorporated in the topsoil. Thus, in any forest or tree-planted area, there is a constant process of removing plant nutrients from the subsoils and concentrating them in the surface soils. The fertility of the topsoils is still further augmented by the fact that the micro-organisms that have the capacity of taking nitrogen from the air and fixing it in the soil as a plant nutrient function much more actively in the well-aerated topsoils than in the compact less-aerated subsoils. In one afternoon of intense rain on steep hillsides this soil fertility, accumulated over many years, can be lost. Large desolate areas of Spain and Italy are examples of the results of soil erosion.

There is some evidence to indicate that soil erosion is cumulative. Thus, on hillsides, after lumbering or destruction of trees from cutting-over in clearing operations, the increased volume and velocity of runoff waters initiate the erosion of the fertile topsoils. With the loss of the topsoils there are less nutrients for plant growth and this causes less natural vegetative covering; and with less vegetation come greater volume and velocity of runoff water and more erosion. The heavy loads of river-borne mud entering the sea after rains are mute evidence of the losses of topsoils which are occurring at the present time in the Republic.

II. DEPLETION OF THE FORESTS

The forests of the Dominican Republic have in the past been one of its most valuable resources. Upon the preservation and improvement of what remains of them will depend the future prosperity of the nation's agriculture. A heavy forest cover should be maintained at all times on the country's extensive mountain areas if the heavy tropical downpours are not to wash away all the soil, leaving the area barren of vegetation.



"CLEARED" LAND READY FOR *Conuco* FARMING

Large areas of the central mountain range were once covered with valuable stands of pine. Today, most of the accessible areas have been cut over and only in the more remote areas are there any stands of commercial size. Little is being done to aid in the reforestation of the cut-over areas or to develop a permanent system of logging. Much the same is true of the precious woods, such as mahogany, lignum vitae, logwood, Spanish cedar, and satinwood. After the valuable species are cut down, weed trees of little value

grow up to take their places. As a result, much of the present forest area consists of species of little commercial value.

Conuco agriculture. One of the most devastating practices in the country today is the system of *conuco* agriculture in which a *campesino* cuts and burns a small area of forest, planting it first to corn and rice, and then to bananas and plantains interspersed with tobacco, yuca, and corn. By the end of the first year only the bananas and plantains remain. After two or three years, when there is not sufficient soil to produce bananas, the area is abandoned and another area burned.

The 1940 agricultural census reports the clearing of 202,000 acres of land in 1939, while 680,000 acres were reported abandoned. Toward the end of the dry season of 1941, the fires were so numerous in the mountains that visibility was restricted by the clouds of smoke. Not only does this practice destroy the forest cover, but it reduces the ability of the forest to reproduce, thus seriously reducing the water-absorbing and -holding capacity of the soil in the area.

Charcoal. Charcoal is produced only from the harder and more valuable species of wood. Thus the needs of the charcoal industry are much the same as those of the lumbering industry. Large amounts of charcoal are used in the Republic, as it is the principal fuel of the tropics for kitchen use. The cutting of small trees for this industry makes the regeneration of forests of good woods extremely difficult if not improbable.

III. POSSIBILITIES IN REFORESTATION

Reforestation of large areas of otherwise useless mountainsides and effective enforcement of laws to protect existing stands would develop an important source of wealth and at the same time preserve the soil and water resources of the country. It is estimated that of the slightly more than 12 million acres in the Republic, perhaps 2 million are steep hillsides and best adapted for timber crops. These 2 million acres might be set aside by law as a national forest to be administered by a soil conservation service. This would not only preserve the forest resources but would preserve the sources of water for rivers and underground reservoirs; it would

lessen floods, minimize the serious effects of droughts, lessen the silting up of reservoirs and harbors. Most important, it would minimize the erosion of the accumulations of centuries of plant nutrients in the fertile topsoils of the country.

Suggested species. Some of the species of trees that might be planted under a reforestation program are discussed below.

The Dominican pine, *Pinus occidentalis*, is particularly well adapted to the lateritic soils and climatic conditions of higher elevations in La Vega, Santiago, and Azua provinces. The wood is widely used for construction in the Republic. It repopulates itself easily on cut-over land, and with control by the proper services of the government can re-establish itself. Probably all pine produced can find domestic markets.

Balsa, *Ochroma lagopus*, which produces a lightweight wood for toy manufacture and similar uses, can endure severe drought. The natural stands in South America are being depleted. Balsa can be seeded easily, is well adapted for utilization of steep hillside lands, is a rapid grower, and quickly establishes a vegetative cover to prevent soil erosion. It is considered principally as an export crop.

Teakwood, *Tectona grandis*, has been planted extensively in the Dutch East Indies and in Puerto Rico and, in the right environment with adequate rainfall, grows comparatively rapidly. Fence posts can be harvested from it in 5 to 7 years and lumber could be cut in 15 years. It is characterized not so much by its hardness as by the straightness of its grain and ease of carpentry. The areas in which reforestation with this species should be attempted are on the steep hillsides on the north coast above Puerto Plata and Cabrera and above Jarabacoa and Janico.

The West Indian mahogany is the species *Swietenia mahogany* and is a slow grower usually found under semiarid rainfall conditions. The Venezuelan species, *S. candollei*, is adapted to wetter environments and grows much more rapidly. It should be given a trial on hillside lands similar to those suitable for teakwood. In Puerto Rico, Venezuelan mahogany has been cut for 12-inch boards when it was but 20 years old. This timber species is considered as of probable value for both domestic use and export.

The planting of small groups or "islands" of trees of this species,

which as they mature form seeds that distribute themselves in the wind and so reseed and cheaply reforest extensive areas, is worthy of trial. In Puerto Rico it has been remarkably successful on a small scale. Much depends upon selecting the correct environment. This method of reforestation is decidedly cheaper than the method of growing trees in nurseries and transplanting them over extensive land areas. Cattle do not feed upon Venezuelan mahogany, so that this species is well adapted to reforesting grazing or pasture land.

The natural seeding method of reforestation might also be successful with balsa and pine. Selection of the proper environment for each species would be of utmost importance.

In many countries of the Far East bamboo enters into the daily life in cities and on farms to an almost unbelievable extent. It is used for kitchen utensils, furniture, animal sheds, corrals, irrigation tubing, fish nets, and baskets, and the sprouts are used for food. It is scarcely used at all in the Western Hemisphere, except in Panama, Colombia, and Ecuador, where it enters into house construction. The species commonly grown, *Bambusa vulgaris*, produces a soft wood lacking in strength and subject to boring insects, such as termites and powder-post beetles, which destroy houses or furniture made of it in a year or two. The United States Department of Agriculture, however, has introduced many species from Asia and the East Indies that have proved to be resistant to boring insects.

Bamboos, once established, have a high degree of drought resistance, but they make faster and greater growth when they have adequate soil moisture. For this reason, areas chosen for bamboo planting should be hillside land unsuited for cultivated crops, at sufficient elevation to receive ample rainfall. Because of their extensive, closely woven root system and the carpet of leaves which they soon form on the surface of the soil, bamboos are especially valuable in checking soil erosion on steep sloping land.

Tree-crop zones. Besides the 2 million acres of hillside suitable only for forests, it is estimated that there are an additional 3 million acres of hillside land too steep for utilization for cultivated annual crops. These areas should be planted solely to bush or tree crops which minimize erosion. There are many valuable tree crops

that could be grown in such places, including cacao, coffee, rubber, and the cashew nut.

Pastures. Large areas of steep hillsides in the foothills have been cleared and planted to permanent pastures. Much of this land is too steep for pastures and should be reforested at an early date. The greater part of it, however, could be maintained in good condition by proper control of grazing. Without irrigation the productivity of a pasture varies through wide limits between dry and wet seasons. An area that is correctly grazed during the wet season will be seriously over-grazed during the dry season. An area correctly grazed during the dry season will frequently be under-grazed and produce a low quality of feed during the wet season. A system of supplementary feed such as soilage crops of elephant grass, sugar cane, or corn, to carry the cattle through the dry season, would make for more efficient use of vast areas of pasture not only on hillsides but in the valleys as well. There are perhaps 2 million acres of hilly lands, besides those mentioned above, which might best be used for pastures.

IV. GENERAL AGRICULTURE

By far the most important land, agriculturally, is that in the valley bottoms and on the coastal plains. While the ravages of erosion are not often so serious on this land, the maintenance of fertility and good physical conditions requires constant attention. Experience has shown that the selection of the proper erosion-resisting crops and proper vegetative coverings for hillside and sloping lands is the most effective and economical method of soil conservation. In addition, there are a few farm practices, such as strip cropping and contour furrowing, which greatly reduce erosion. Of the engineering practices available, manguam terraces and contour canals, described in any textbook on soil conservation, are of proved soundness and economy.

Maintaining an adequate supply of humus material, upon which the physical conditions of the soil largely depend, is difficult under constant high temperatures. All plant or organic matter such as crop residue should be plowed under. A regular program of green manure crops may be necessary in some cases where the crop

residues are inadequate. The incorporation of adequate amounts of organic material is difficult with the equipment in common use on the smaller farms, where the common source of power is a team of work oxen or human labor. Neither of these is adequate to turn under any appreciable amount of straw or other plant material effectively. The common practice of burning off all grass and weeds before plowing destroys humus material, causes the physical conditions of the soil to deteriorate, and reduces its water-holding capacity.

V. CONSERVATION EDUCATION

In addition to effective administration of forest lands and soil-conservation zones by the government, a campaign of education concerning soil erosion and conservation is essential so that every adult citizen and school child, city dweller as well as rural inhabitant, is familiar with the subject and its vital effect on his own future and well-being. The small farmer, especially, should be taught how to preserve his property for his own benefit and that of his children. It will of course be extremely difficult to regulate such practices as *conuco* farming and the cutting of young trees for the making of charcoal, but a failure to do so will result in incalculable damage to the nation's interests.

CHAPTER X

INDUSTRIAL DEVELOPMENT

Dominican industry is largely directed toward the processing of agricultural products for domestic consumption and export. Of these products, sugar is by far the most important in bulk and value. Its overshadowing position is illustrated by the fact that it accounts for more than four-fifths of all industrial capital investment and approximately three-fourths of industrial employment and wages.

Food and beverage industries other than sugar account for about 7 per cent of total industrial capital investment. Miscellaneous industries account for about 10 per cent of the total, the largest single item, by far, being electric power. Products of these industries include soap, alcohol, clothing, lumber, cigarettes, matches, leather goods, and various others, most of which are for domestic consumption.

Industrial development has been limited by the meagerness of mineral resources, including fuel. Although mineral deposits have been reported in various parts of the country, the quantity is generally too small or the quality too poor for commercial development. Small deposits of high-grade iron ores are said to exist, but there is no coal. Gold, copper, salt, gypsum, and amber are exploited on a small scale.

Oil exploration is going forward, but the relatively small quantities produced to date are of low grade. Hydro-electric possibilities do not appear large, and such sites as may exist have not been developed. The only large power company uses imported oil, and the sugar centrals burn bagasse, a waste product, to generate their power supply. Wood and charcoal are the domestic fuels generally used.

Only in recent years has the country trained its youth for specific industrial employment. Education for crafts and industries is now offered to men in schools of manual arts in Ciudad Trujillo, Santiago, San Cristóbal, and La Vega, and to women in industrial

schools in Ciudad Trujillo and Santiago. The University of Santo Domingo is said to supply industries with men trained in structural engineering, but it does not offer adequate instruction in mechanical and electrical engineering.

In the following pages an attempt is made to present an over-all statistical picture of Dominican industry, together with a brief review of industrial legislation and taxation. A more extended discussion of many existing industries, as well as possibilities of new ones which appear worthy of consideration, is given in Appendix C.

I. CHARACTERISTICS OF DOMINICAN INDUSTRY¹

About 80 per cent of Dominican industry is directly allied to agriculture, and the sugar industry accounts for the greater part of this, as is indicated in the table below.

	Foods and Beverages (As percentage of total)	Sugar Alone (As percentage of total)
Invested capital	90	83
Raw material consumed	80	60
Sales value of product	72	50
Industrial employment provided	81	72
Industrial wages paid	82	76

The sugar industry is concentrated in large establishments, numbering only 12 of the 1,342 companies reported in the 1937 official survey. The remainder consist of relatively small companies and institutions engaged in a wide variety of enterprises. Aside from sugar, only two industries have an investment of more than \$1,000,000—electric power with \$2,500,000, and starch with \$2,000,000. Investment in electric power covers about 14 plants, while the starch investment represents the operations of a single American company. The remainder range from a \$375,000 investment in a cigarette factory down to the few dollars of capital utilized in home or small-shop production of the needle trade.

Foods and beverages. The foodstuffs section of the Dominican government industrial survey is made up of some 20 diverse industries covering in varying degree the primary food and beverage

¹ Based on data contained in the *Anuario Estadístico de la República Dominicana*, for 1937, 1938, and the preliminary report for 1939.

needs of the country behind a relatively high protective tariff system. Except for sugar and starch, the industry operates chiefly for the domestic market. In many respects production methods are primitive, for, on balance, hand labor is often cheaper than machinery. It is less efficient, however, and quality of the product is frequently poor. Judged by best modern practice in the production and handling of foods, sanitary standards are low.

The various industries that go to make up the food and beverage group are listed in the accompanying table, together with the capital invested and the number of establishments in each industry.

FOOD AND BEVERAGE INDUSTRIES, 1937^a

Industry	Capital Invested (Thousands)	Sales (Thousands)	Number of Establishments
Sugar.....	\$51,893.8	\$11,107.4	12
Rice milling.....	447.4	1,528.9	98
Wines and liquors.....	655.2	1,029.2	21
Bakeries (bread).....	351.0	566.2	134
Beer.....	50.0	326.9	1
Starch.....	2,000.0	223.1	1
Ice.....	448.5	122.0	32
Alimentary paste.....	90.0	114.5	5
Butter and margarine.....	32.2	111.9	10
Cheese.....	40.0	82.4	88
Milling (wheat flour).....	34.8	76.7	1
Meat products.....	40.7	64.2	4
Coffee roasting.....	16.6	58.7	7
Soft drinks.....	14.9	44.1	11
Ice cream.....	15.3	32.3	11
Table oil.....	70.0	18.6	1
Miscellaneous.....	60.1	945.8 ^b	142
Total.....	\$56,260.5	\$16,452.9	579

^a *Anuario Estadístico*, 1937, Vol. 2, pp. 86-121.

^b Includes 750.1 thousand dollars from certain by-products (molasses, 737.6; bran, 8.0; lard, 4.0; oil cake, 0.3; and soap stock, 0.2) and 195.7 thousand dollars from other industries (corn meal, 52.2; miscellaneous confectionery and conserve, 139.3; and vinegar, 4.2).

The most noticeable deficiency in the list is the relatively small output of fats. Including meat products, the domestic industry provided only 12 cents' worth of fats per capita in the year under review. Slaughtering is omitted from the table above, but in 1937 the domestic supply of all animals slaughtered was only around

25 pounds per capita live weight.^a In the same year the value of imports of lard, canned meats, butter, and table oil was more than double that of similar domestic production.^a

Other industry. For convenience of presentation and because of the minor position it occupies, all industry not included in food-stuffs and beverages is grouped under the heading of "other industry."

INDUSTRY OTHER THAN FOODS AND BEVERAGES, 1937

Industry	Capital Invested (Thousands)	Sales (Thousands)	Number of Establishments
CHEMICAL PRODUCTS.....	\$ 714.4	\$ 1,774.8	52
Alcohol	320.0	641.6	5
Salt.....	50.0	562.5	1
Soap.....	272.3	473.8	15
Miscellaneous ^b	72.1	96.9	31
LEATHER AND LEATHER GOODS.....	260.5	823.7	161
CLOTHING.....	400.3	716.6	197
ELECTRIC POWER AND METAL WORKS.....	2,500.0	689.6 ^b	44
LUMBER AND WOOD WORKING.....	492.6	433.5	180
STONE, CLAY, AND MANUFACTURES.....	127.3	91.6	18
MISCELLANEOUS.....	1,652.7 ^c	1,901.3	111
Cigarettes.....	375.0	941.9	1
Cigars.....	153.7	361.5	52
Matches.....	200.0	243.5	2
Other ^d	674.7	354.4	56
TOTAL "OTHER" INDUSTRIES.....	\$ 6,147.8	\$ 6,431.1	763
TOTAL FOOD INDUSTRIES.....	\$56,260.5	\$16,452.9	579
GRAND TOTAL ALL INDUSTRIES.....	\$62,408.3	\$22,884.0	1,342

^a Cosmetics and pharmaceuticals.

^b Of which electric power accounts for \$652,868.

^c This total adds to \$1,403,400. Either there is an error in the official total as given or in the various capital items which go to make it up.

^d Includes printing, lithographing, photoengraving, nails, needles, rubber goods, and containers.

With some notable omissions this is a fairly comprehensive and diversified group of industries for the supply of primary requirements. Communications and transport—rail, road, and wire—are

^a In thousands of kilograms live weight: cattle, 12,039, hogs, 5,145, sheep, 7, goats, 189, total, 17,380 or 38,156,000 pounds. *Anuario Estadístico*, 1937, Vol. 2, pp. 54-57.

^b Imports in 1937: lard, \$102,000, canned meat, \$42,000, butter, \$4,000, table oil, \$234,000, total, \$382,000. *Sumario de Comercio*, 1937, compiled by Receptoría General de Aduanas.

not included. In the main, industries which constitute the various subdivisions are allied and related, but the miscellaneous group is quite varied. Aside from particular industries specified, this group includes printing, lithographing, photoengraving, nails, needles, rubber goods, and cardboard containers. The manufacture of containers conceivably offers the greatest agricultural and industrial opportunity which is presented to the colonists, and will be discussed later in more detail.

Local industry is heavily dependent upon domestic agriculture. In 1937 as much as 80 per cent of all raw material used in Dominican industry was of domestic origin, and the great bulk was agricultural. The foodstuffs group consumed 90 per cent of the domestic raw materials and 31 per cent of those imported. There is room for agricultural expansion in the displacement of some imports, notably oils, fats, and containers.

Fuel and power. The only native fuel supply is wood, burned largely in the form of charcoal, although a commercially unimportant flow of oil has been tapped and there are some indications of oil elsewhere. Industries other than the sugar companies, which burn bagasse, must import fuel or buy power.

Poor transport facilities for internal bulk shipments are probably more of a factor in the high cost of Dominican power than is the price of imported fuel delivered at Dominican ports. Whatever the other factors may be, power costs are too high in many cases to compete with cheap manual labor, and more efficient production by mechanized methods is thus blocked.⁴

II. COMPARATIVE POSITION OF MAJOR INDUSTRIAL LINES

The table on page 174 shows the consolidated operations of Dominican industry for the three years under review, by major items and by broad classification of industry similar to that previously employed in discussing the consolidated figures for 1937.

Capital. The capital invested in Dominican industry is that currently reported, and in the case of sugar it reflects a substantial write-off, mainly through reorganization. At the end of 1939, manufacturing industry reported total capital of almost 75 million

⁴ See discussion of fuel resources in App. C.

COSTS, PROFITS, WAGES, AND EMPLOYMENT IN DOMINICAN INDUSTRIES, 1937-39^a

Industry	Gross Profits ^e																	
	Costs ^d									Average Yearly Costs per Worker								
	Capital ^b (In thousands of dollars)			Sales ^c (In thousands of dollars)			Amount (In thousands of dollars)			As Percentage of Sales			Amount (In thousands of dollars)			As Percentage of Capital		
1937	1938	1939	1937	1938	1939	1937	1938	1939	1937	1938	1939	1937	1938	1939	1937	1938	1939	
Foods and beverages	56,261	65,880	67,289				16,453	16,293	18,934	11,000	14,608	15,675	85	90	83	2,453	1,685	3,250
	51,894	60,000	61,461	11,107	9,807	11,803	10,408	10,043	10,545	94	102	90	699	—236 ^f	1,258	7½	1	
	4,367	5,880	5,828	5,346	6,486	7,130	3,592	4,565	5,130	67	70	72	1,754	1,921	2,000	40	32½	34½
All other in- dustry...	6,147	7,557	7,432	6,431	6,864	6,997	3,397	3,862	3,832	53	56	55	3,034	3,002	3,165	49	40	42½
	62,408	73,437	74,722	22,884	23,157	25,931	17,397	18,470	19,507	76	80	75	5,487	4,687	6,424	8½	6½	8½
Industry	Wages (In thousands of dollars)			Employment			Average Yearly Wage			Capital Investment per Worker			Average Yearly Sales per Worker			Average Yearly Costs per Worker		
	1937	1938	39	1937	1938	1939	1937	1938	1939	1937	1938	1939	1937	1938	1939	1937	1938	1939
Foods and beverages	5,252	5,097	5,364	25,770	26,895	29,914	204	190	179	2,183	2,450	2,250	638	606	633	543	543	524
	4,907	4,653	4,910	22,924	23,840	27,346	214	195	180	2,264	2,870	2,246	488	412	432	454	421	386
	345	444	454	2,846	3,055	2,568	121	145	177	1,555	1,925	2,269	1,878	2,123	2,777	1,262	1,494	1,998
All other in- dustry...	1,219	1,362	1,205	6,186	7,299	5,820	197	187	207	995	1,035	1,277	1,039	941	1,200	549	529	638
	6,471	6,459	6,570	31,956	34,194	35,744	203	189	184	1,960	2,146	2,093	716	677	726	544	540	543

^a Arranged and computed from data contained in *Anuario Estadístico*, 1937, 1938, and preliminary returns for 1939.

^b Capital currently reported. Changes mainly due to variation in number of establishments reporting from year to year.

^c Sales value of several products includes excise taxes.

^d Reported costs include raw materials, wages, fuel and power, containers, and packing.

^e Before taxes, depreciation, fixed charges, etc.

^f Deficit.

dollars. At first glance this appears to indicate an increase of some 12 million dollars over 1937, but the difference is due chiefly to the fact that many industries not reporting in 1937 did so in the latter year. These included two sugar centrals whose capital aggregated 9.5 million dollars. The average capital per sugar establishment was around 4.3 million dollars, in contrast with an average of about \$8,000 in all other industry.

Capital costs per worker, that is, the average capital investment necessary to provide one job, are fairly uniform for industry as a whole. All Dominican industry averaged about \$2,000 from year to year, sugar alone about \$2,300, and others in the food group close to \$2,000. In the miscellaneous group the average is only about \$1,100 per worker employed. Small though the latter is, when compared to similar capital costs in Europe and the United States, it is nevertheless an important factor in any attempt to establish refugee industry.

Sales. Combined sales reported by Dominican industry range from about 23 million dollars to almost 26 millions per year. Sugar accounts for nearly half of this, with the remainder about evenly divided between the rest of the food groups and all other industries. During 1939 combined sales were about 3 million dollars over the 1937 total, the increase being in industries other than sugar. The value of sugar sales was somewhat higher, after a setback in 1938.

Sales in 1939 averaged almost \$15,000 per unit of industry, sugar alone being around \$845,000. Other foods averaged close to \$11,000 per establishment, and the remaining miscellaneous industries about \$6,940. The unit sales of industry as a whole showed a decrease of about 10 per cent, as did sugar, while the miscellaneous group was down about 20 per cent. On the other hand, foods other than sugar reported an increase in sales per establishment of around 16 per cent. However in every group except the miscellaneous industries, unit sales in 1939 showed a substantial recovery over 1938. In general this reflects a war improvement in the sensitive prices, and the heavy weighting of rigid prices in the miscellaneous group.

Yearly sales per worker for industry as a whole averaged around \$700. In sugar alone the average was close to \$450, but in others

of the food group sales per worker averaged about \$2,260. For the remaining miscellaneous industries the average was around \$1,050. In the sugar industry, sales per worker during 1939 were about 12 per cent under 1937, while those of the remaining food group increased almost 50 per cent, and were 15 per cent higher in the miscellaneous industries. These changes reflect the fact that the number employed in the sugar industry increased sharply, while employment in other industries declined.

Costs. The cost data are not all that could be desired, but are vastly better than are available in most countries. The figures on wages, raw materials, fuel and power, containers, and packing are available, but there are none for depreciation, taxes, or overhead administration and sales costs. Consequently the differences shown between costs and sales are gross earnings, subject to various deductions, and by no means represent net profit.

For all industry, total costs as reported average about 18.5 million dollars over the three years, or 77 per cent of the sales figure. Costs in the sugar industry of around 10.3 million dollars account for 56 per cent of the total; other foods about 4.4 million dollars, or 24 per cent; and miscellaneous industries around 3.7 millions, or 20 per cent. These reported costs equal 95 cents, 70 cents, and 55 cents, respectively, per dollar of sales.

Although total costs over the three years rose, costs per industrial establishment declined, with the exception of foods and beverages other than sugar. On the other hand, costs per worker employed, although somewhat lower in sugar, show a substantial rise in the other industrial groups. In the main this represents the difference between industries that can pass costs back to labor and those which can pass costs forward to the consumer. In the former, labor suffers a reduced income although employment may gain. In the latter, those employed stand a very good chance of benefiting, although employment itself may eventually suffer from curtailed consumer demand. This is probably what happened in the instance above for wages^a declined in sugar but employment^b increased, while in the other categories of industry wages increased but employment declined.

^a Average annual wage.

^b Both total numbers employed and the average per establishment.

In industry wage costs average 35 per cent, raw materials 55 per cent, and other costs 10 per cent. Although this cost structure is typical of the miscellaneous group, sugar and the remaining foods and beverages show a considerable departure from the average in wage and raw material costs. In sugar, wages constitute 47 per cent and raw materials 43 per cent of total costs reported; in the other industries of the food group wages are only 10 per cent while raw materials are 80 per cent of the costs. The latter is of interest from the refugee standpoint as indicating a minimum opportunity for employment but the maximum industrial market for agricultural produce.

Costs for fuel, power, containers, and packing are relatively constant at around 10 per cent throughout all groups.

Gross earnings. As previously stated, the "gross earnings" item is simply the difference between industrial sales and costs, without deduction for administration and sales, overhead, taxes, depreciation, and fixed charges. While this is entirely inadequate as an estimate of actual earnings, it nevertheless is useful for comparative purposes.

Gross earnings of all industry over the three years averaged around 5.5 million dollars, or about 7.3 per cent on the current capital investment. In the sugar industry the average gross was \$574,000 or about 1 per cent on the capital reported.⁷ On the other hand, the remaining foods and beverages showed an average gross of almost 1.9 million dollars, or 37.3 per cent on capital, and the miscellaneous industries averaged about 3.1 million dollars, or around 43.6 per cent on current capital. If the returns accurately represent the position of the sugar industry as a whole, it is doubtful that there were any net earnings. But the gross in the other groups was such that even substantial deductions would still leave a good margin for net profit for the low-cost industries. As the miscellaneous group is heavily weighted with monopoly and semi-monopoly enterprise, the high ratio of gross to capital must be discounted accordingly.

Following the generally poor year of 1938, when the gross of all groups declined sharply, there was a recovery in 1939 mainly occasioned by the effect of war on world prices. On the basis of

⁷ In 1938 the industry reported a deficit of \$236,000 before overhead, taxes, depreciation, and fixed charges.

gross earnings per reporting establishment, sugar in 1939 showed a marked improvement over 1937, and other foods recovered to about the 1937 level, but gross earnings in the miscellaneous group still remained about 20 per cent below 1937. This picture reflects both the nature of the industries and the nature of the price advance.

The ratio of costs to sales, of gross earnings to capital investment, of capital per establishment, of capital cost per worker employed, and so forth, remain fairly constant for the various groups and in the individual industries. Costs are generally lowest in the monopoly or semi-monopoly industries, such as alcohol, cigarettes, matches, electric power, and brewing. They are monopolies not because competition is prohibited by the state, but because of a contractual relationship or an investment position which precludes successful competition.

III. INDUSTRIAL LEGISLATION AND TAXATION

Industrial enterprises must be entered on the industrial register in the Department of Agriculture, Industry, and Labor before starting operations. The various facts which must be disclosed to the department are held confidential. Details of the requirements are enumerated in Regulation No. 385, of September 16, 1939.

Labor laws. Dominican labor legislation is simple and modern. Working hours are limited by law to 8 hours a day and 48 hours a week for laborers, excluding persons employed in inspection, management, and other executive positions. An increase of the daily working hours to as much as 10 hours may be permitted in certain cases when this excess is paid for at normal wage, or when the worker is required to work correspondingly less during some other day of the week. In no case may the total of working hours in a week exceed 58, unless special permission is obtained from the Department of Labor. Provision is made for the registration of unemployed laborers.

The law requires the employer to compensate the workman or his family in case of accident or death due to accident. When the accident leads to a temporary disability, the worker is entitled to half his usual wage while disabled, but not more than \$10 a week for a maximum of 80 weeks. In case of total and permanent dis-

ability the weekly compensation maximum of \$10 may have to be paid for as much as 100 weeks. The law specifies the maximum indemnity in case of various accidents (loss of arm, hand, eyes, hearing, etc.). In case of death caused by an accident within 12 months of the accident, funeral expenses up to \$40 must be paid; in addition, half the usual wage of the deceased must be paid to his family for a specified number of weeks, depending on the relationship of the beneficiaries to the deceased.

Employees may form mutual protective associations or may take out workmen's compensation insurance with a licensed insurance company. All accidents must be reported to a justice of peace, who determines the character and seriousness of the accident and decides on the indemnity to be paid.

Employees who are paid weekly wages, or semi-monthly or monthly salaries, and who are employed by the same employer continuously for a period of at least one year, are entitled to two weeks of paid vacation.

The law regulates also work in three shifts in certain industries with continuous production, work on holidays, and work of nursing mothers. It forbids employment of persons less than 14 years old, and of women between the hours of 10 P.M. and 5 A.M., and requires the establishment of rest rooms in all factories or shops which employ women.

Minimum wages are determined whenever necessary by a government committee which, until August 1941, had ordered minimums in only four industries: manufacture of men's shirts and underwear, bakeries, cigar factories, and shoe factories. The wage minimum is set by the job rather than by the hour. There is no requirement as to an hourly minimum, but most industries seem to observe a tacit hourly minimum of 4 cents.

Sunday rest, closing hours of shops and plants on week days, and provision for recognized holidays are regulated by law. All work must stop at 6 P.M. unless longer hours are essential because of public interest or in order to prevent losses. Exemptions in deserving cases may be permitted by the Department of Labor on payment of a stipulated tax per day, the amount depending on the size of the establishment.

Native employees must make up at least 70 per cent of all the active and retired personnel of an industrial (commercial or agricultural) undertaking, and a similar proportion of total wages and salaries likewise must be paid to Dominicans. Interruption of continuous work caused by illness does not interfere with the right to a paid vacation. When an employee who is entitled to a vacation agrees to work during the time of his rightful leave, he must be paid triple wage or salary.

It is understood that the labor laws outlined above are not uniformly or consistently enforced. Since there are no effective labor organizations, the workers are dependent on government recognition of abuses and look to official action in carrying out reforms. There is no outward evidence, however, of labor unrest or of dissatisfaction with the treatment of labor by employers.

Taxation. It is essential that anyone contemplating the establishment of an industrial enterprise first become thoroughly conversant with Dominican taxes from official sources. The situation is so complex that no attempt is made here to set forth figures that might apply to particular types of enterprises.

An industrialist must obtain special licenses to manufacture and to import and export. He has to pay a tax on insurance premiums and an excise on certain goods produced. For all goods imported he must pay the regular customs duties and supplementary duties called *impuestos*, which frequently modify the original tariff rates. The situation in this respect is especially complex, and the services of an informed and experienced adviser, at least in the first stage of industrial development, will be helpful. On exports, one must pay a cargo tax and a multitude of stamp taxes on various business transactions and documents. Both in discharging and loading boats, a handling charge must be paid to the government, which employs the *stevedores*.

CHAPTER XI

TRANSPORTATION

The internal transport system of the Dominican Republic consists of 3,180 miles of roads and 762 miles of steam railways. Despite its extensive coast line, coastwise transportation is unimportant. A general picture of inland transport facilities is afforded by the table below.¹

Mileage of all roads	3,180
Government highways	1,180
Municipal roads, total	2,000
<hr/>	
All-weather	960
Dry-weather	1,040
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Number of motor vehicles	2,894
Passenger cars	1,482
Private	731
Public	751
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Trucks and buses	863
Motorcycles	549
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Number of other vehicles	5,421
Carts and wagons	1,653
Pushcarts	1,016
Carriages	95
Bicycles	2,657
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Track mileage of steam railways	762
Government railways	152
Sugar-estate railways	610

I. HIGHWAYS

Road building has been a leading item in the government's program, and approximately half the present system of government roads has been constructed since 1929. The section along the north-east coast is the only valuable undeveloped area which cannot now be reached by road. Highways at the present time are being maintained in such condition that they can be used by motor vehicles throughout the year, but the burden of costs is relatively heavy.

¹ Compiled from *Anuario Estadístico de la República Dominicana*, 1939, Vol. 2, p. 598.

The municipal roads often can be used only by bull carts and pack animals.

Construction of highways has progressed more rapidly than their use by motor vehicles. During the past 10 years of extensive road construction, imports of motor vehicles have averaged only 420 per year, while the corresponding average for the preceding 10 years was 880 vehicles annually. Both the world depression and higher direct and indirect taxes on automobiles and trucks have cut down highway use. Numbers of automobile and truck imports in the years 1920 through 1939 are shown in the table below.

AUTOMOBILES AND MOTOR TRUCKS IMPORTED INTO THE
DOMINICAN REPUBLIC, 1920-39^a

Year	Auto- mobiles	Motor Trucks	Total	Year	Auto- mobiles	Motor Trucks	Total
1920.....	500	200	700	1930.....	300	100	400
1921.....	100	—	100	1931.....	100	100	200
1922.....	200	—	200	1932.....	100	100	200
1923.....	700	—	700	1933.....	200	100	300
1924.....	700	100	800	1934.....	300	100	400
1925.....	1,100	200	1,300	1935.....	300	200	500
1926.....	900	300	1,200	1936.....	300	200	500
1927.....	1,000	300	1,300	1937.....	400	200	600
1928.....	1,400	400	1,800	1938.....	400	200	600
1929.....	600	100	700	1939.....	300	200	500
Average.....	720	160	880	Average.....	270	150	420

^a Compiled from *Estudio Estadístico de Algunos Aspectos del Comercio Exterior de la República Dominicana, 1920-1939*, published by the National Statistics Office, 1941. Figures were rounded in source.

As compared with seven motor vehicles to every mile of road in the United States,² there is less than one per mile in the Dominican Republic. Even in thinly populated states, such as Nevada, there are as many as five motor vehicles per mile of rural and state roads, and there is no state where the ratio is as low as in the Dominican Republic. The difference is much greater if figures for surfaced highways only are used.

More highways are needed to reach remote sections. In addition to the roads necessary for the development of the northeast region,

² Total rural road mileage in the United States amounted to 3 million miles in 1930. Registered motor vehicles totaled 23 millions in the same year.

it would be desirable to open up the mountain sections to permit the growing of crops adapted to highland regions. Lack of roads eliminates from serious consideration, at present, some regions which might be well suited for occupation by European immigrants.

II. RAILWAYS

As the table on page 181 indicates, the railroad system consists of two types—610 miles of sugar-estate railways and 152 miles of



HAULING CACAO TO THE RAILROAD ON BULL BACK

government railways. The sugar railways are not common carriers and serve only the industrial needs of the sugar centrals.

The country's two government railways formerly played an important part in the development of the Cibao region, but have become less important with the construction of highways and the growth of motor transportation. Both the line from Puerto Plata to Santiago and Moca (Ferrocarril Central Dominicano) and the line from Sánchez to La Vega and Moca (the Samaná-Santiago

Railroad³) are now the property of the government, under the name Ferrocarriles Unidos Dominicanos. Operations of both railways are compared in the table below.

	Dominican Central Railroad (1939)	Samaná- Santiago Railroad (1938)
Revenues		
Freight	\$ 75,500	\$80,000
Passengers	4,500	
Miscellaneous income	2,000	
Handling (<i>arimo</i>)	38,000	
Government contribution	18,000	
Total revenues	\$138,000	
Expenditures		
Maintenance of road	\$ 34,000	
Maintenance of rolling stock	17,000	
Transportation cost	41,000	
General costs	13,000	
Handling (<i>arimo</i>)	24,000	
Total expenditures	\$129,000	
Commodities carried (in thousands of kilograms)		
Yuca	7,794	
Sugar	1,594	
Gasoline and oil	1,576	
Cement	716	
Lumber	346	
Rice	279	
Others	3,586	
Total	15,891	20,645

As indicated in the table, the government directly contributed \$18,000 to the revenues of the Dominican Central Railroad in 1939. In addition, the government endeavored to divert highway freight to the railroad by charging a toll (recently removed) on the Santiago-Puerto Plata highway in 1939. Apparently no reserves were being set up in 1939, and it is evident from the figures given that operations were not satisfactory. Adequate figures are not available, but it appears doubtful that operations of the Samaná-Santiago branch are more profitable than those of the Dominican Central.

³ Known locally as the "Scotch Railroad." It was operated under British direction and control for nearly 60 years.

As is apparent from the list of commodities carried by the Dominican Central, about half the freight consists of yuca transported for the tapioca industry. Much of the balance consists of building materials and gasoline. The relatively small importance of the railroad is indicated by the fact that while 57,000 tons⁴ of merchandise were exported from Puerto Plata in 1939, the railroad in the same year transported only 16,000 tons of freight between all stations. Both railways together, in fact, handle a very small fraction of the domestic commerce of the country. The Samaná-Santiago railroad has a monopoly of traffic to Sánchez and the Samaná Bay region in places where there is no highway. The Dominican Central line does not perform even the function of keeping motor trucking freight rates down, since, in effect, highway transportation is taxed to enable the railroad to operate.

The railroads have suffered somewhat in recent years from diversion of freight to the highways.⁵ The truck has obvious advantages for certain types of traffic and a flexibility in operations which makes it an important competitor. It is reported that the government has considered abandoning the railroads and using their roadbeds for highways.

III. SHIPPING

Coastwise trade is surprisingly unimportant in the Dominican Republic, considering the insular character of the country and the fact that a number of regions can be conveniently reached only by sea. For example, the remote coastal region in the northeast has not been penetrated by either railways or highways. Coastwise shipping in 1939 carried only 11,290 tons of cargo,⁶ 80 per cent of which was between ports on the south coast. This is an insignificant amount compared with 634,000 tons of export commodities shipped abroad annually and over 130,000 tons of import cargoes. Lack of

⁴ *Anuario Estadístico*, 1939, Vol. 2, p. 347.

⁵ " . . . the British owned railroad [the Samaná-Santiago] is said at one time to have been a very profitable investment. It is understood, however, that in recent years, it has suffered—as has happened in the case of other railroads in other countries—from the competition of motor transportation on newly developed highways." Dominican Customs Receivership, *Report of the 33d Fiscal Period . . . 1939* (1940), p. 12.

⁶ *Anuario Estadístico*, 1939, Vol. 2, p. 437.

good harbors, and small cargoes, apparently have been dominant factors, rather than lack of initiative or capital. There are no data covering river traffic, but it is believed to be negligible.

The two vessels of the *Naviera Dominicana*, engaged chiefly in trade with Puerto Rico, the Dutch West Indies, Martinique, and Guadeloupe, carried 20,000 tons of cargo in 1939. Later figures are not available, but it is likely that with the present demand for cargo space and higher freight rates, this relatively new enterprise of the Dominican government has become a profitable and useful aid to Dominican foreign trade.

Foreign shipping, of course, carries the bulk of Dominican foreign trade. In 1939, about a third of the export trade (chiefly sugar) was carried in British vessels, with United States ships carrying 30 per cent. French and Netherlands vessels carried most of the remainder.

The shipping situation at present is constantly changing, with freight rates going up and cargo space scarce. It is futile to predict the possible repercussions of the wartime shipping shortage on Dominican foreign trade and on domestic business.

CHAPTER XII

DOMESTIC TRADE AND COMMODITY PRICES

There were approximately 12,200 licensed retail and wholesale dealers in the Dominican Republic in 1939. Distribution is also carried out through public markets where farm produce and other commodities, chiefly domestic, are sold direct to consumers. Important services of distribution are also rendered by manufacturing establishments, particularly by food processors and by establishments which sell direct to the public, such as the clothing and leather industries, tinsmiths, and furniture factories.

I. WHOLESALE TRADE

The wholesale trade is represented by about 1,500 licensed dealers, officially recorded.¹ Importers of manufactured tobacco, leather, lumber, liquors, motor vehicles, and dealers in special products such as radios, gasoline motors, electrical supplies, scrap iron, and optical lenses are licensed under separate categories. Licenses issued to dealers in these commodities indicate that there were not more than 370 in 1939. There are 36 licensed dealers in gold for export, and 17 dealers in honey and beeswax.

The largest group in the wholesale trade consists of assemblers, buyers, and brokers of export products, exporters, and those engaged in the buying and selling of farm products for domestic consumption. The license list recorded a total of about 900 dealers in these commodities in 1939, including dealers in unhulled rice and raw tobacco. There are no official figures covering exporting establishments, but from other sources it has been established that there are about 130 individual exporting houses located in the principal ports and buying centers of the Republic. In Ciudad Trujillo there are 6 exporters of cacao and coffee, 2 of livestock, 3 of hides, and 32 of fruits and vegetables. There are 8 concerns at Ciudad Trujillo exporting bananas and 6 at Puerto Plata. There

¹ The number of individual establishments is probably smaller because of duplication where dealers engage in more than one type of wholesale trade.

are 9 tobacco buyers and exporters at Santiago. Six concerns at Puerto Plata export both coffee and cacao.

II. RETAIL TRADE

Of the retail establishments, 10,000 may be classified as small food stores, meat markets, and general merchandise stores operated by the owner and his family. About 6,000 licensed general stores and meat markets are listed as located in rural areas, with about 3,800 stores of the same type in urban districts.

Although figures are not available, it is believed that the greater part of the retail trade is carried on through general stores and meat markets. The general stores usually sell domestic foodstuffs (particularly plantains, bananas, rice, dried beans, cassava bread, fresh fruits, and coffee); imported goods, such as cotton cloth and salt codfish; and the products of domestic handicrafts, for example, cordage, rush saddle bags, sandals, and tinware. Between 6,000 and 7,000 stores have licenses to deal in liquor and tobacco. Retail meat markets usually sell only meat, of local origin. Retailers often obtain their goods directly from the producer or the food-processor, without using any intermediate distributing agency, but public markets in the cities and in some rural localities serve to some extent for large-scale wholesale and retail food distribution. In the capital, butter and milk are distributed through door-to-door delivery from the larger dairies. Bread is sold in the general stores and grocery stores in the cities, while in rural districts it is usually delivered to consumers by pack animals. Peddlers in the cities sell fresh vegetables and fruits, confectionery, poultry, eggs, fish, cheese, coconuts, and cashew nuts, and especially charcoal. There were 86 licensed peddlers in 1939.

Retail trade is also handled by hardware stores, of which 43 were recorded in 1939. The typical hardware store in the cities fulfills the function of a department store, handling a wide variety of merchandise, chiefly imported, consisting of household utensils, glassware, paints, novelties, luggage, electrical supplies, farm implements, and general hardware. Other typical retail outlets include: milk dealers, 492; drugstores, 199; jewelers, 4; bookstores, 21; second-hand dealers and pawnbrokers, 48:

The volume of business done through public markets is indicated by municipal receipts from "markets and shelters," which yielded \$84,000 in revenue in 1939. The municipalities expended \$2,529 for upkeep of "markets, shelters and corrals" in the same year. Also, there were 168 licenses issued in 1939 for the use of stalls in public markets. A considerable volume of merchandise must be distributed in this way, particularly in the urban centers, but there are no statistics covering sales.

Retail stores in the capital are modern in appearance, and up-to-date in their merchandising methods and in the services they render to customers. In other urban centers facilities are less developed, and the often inadequate distribution of foodstuffs in the rural district leads to nutritional deficiencies in the diet. Until rural distribution is developed by better warehousing, refrigeration, canning and preserving facilities, cheap transportation, and effective handling of perishables, the diet necessarily will remain confined largely to such crops as corn, dried beans, rice, meat, and whatever fruits and fresh vegetables consumers are able to grow for themselves.

There are no figures covering the volume of retail distribution, and only rough approximations are possible. General merchandise and hardware stores distribute most of the imported merchandise with the exception of commodities such as building materials, petroleum products, heavy machinery, and apparatus. The value, in country of origin, of imports distributed through ordinary trade channels amounts to about 8 million dollars yearly. Distributed sales of food crops, meats, livestock products, fruits, and nuts are believed to have a farm value of from 12 to 15 million dollars annually, although these figures necessarily are conjectural. Domestic manufactures distributed in the Republic were worth 11 million dollars in 1938, or about 12 million dollars if the estimated value of home-industry products is included. Thus, distributed sales in round numbers evidently must cost wholesalers and importers about 32 million dollars annually on the basis of prices and volume of business during the past several years.

The prices paid by consumers at retail stores must cover customs duties and charges and various forms of consumption taxes, as well

as the general expenses of distribution. Consumption taxes on the basis of the 1941 budget estimates amount to about 7 million dollars. There are no data covering wholesale and retail distribution expenses.

Average annual turnover of merchandise is difficult to determine satisfactorily, because recorded inventories are not classified by types of merchandise or types of stores. In 1939 the 10,000 retail stores of all kinds were reported to carry inventories totaling 15 million dollars, and in recent previous years stocks generally have varied between 10 and 15 million dollars. This would indicate stocks of \$1,000 to \$1,500 per store, including in the average large establishments carrying inventories many times larger than those of the typical store. Probably the typical general store carries stocks of merchandise worth no more than \$200 or \$300. Turnover varies, of course, from many times a year in the case of food stores to a very slow turnover in hardware and certain specialty stores. The average, indicated by the figures above, of three or four times per year, seems reasonable in view of the many types of merchandise entering into the figures.

III. COMMODITY PRICES

The table on page 191 presents wholesale and retail prices for the principal domestic foodstuffs sold in the markets of the Republic. The average spread between retail and wholesale prices is roughly comparable to that in the United States, despite the relative complexities and better services to producers and consumers rendered by middlemen and retailers in the latter country. Operating expenses of retail food stores as a percentage of net sales in the United States in 1935 were: dairy product stores and milk dealers, 33 per cent; fruit stores and vegetable markets, 18 per cent; meat markets, 17 per cent; combination stores, 15 per cent; egg and poultry dealers, 15 per cent.² These percentages roughly measure average mark-ups necessary to cover costs, and indicate the approximate average spread between wholesale and retail

² U. S. Department of Commerce, *Statistical Abstract of the United States*, 1939, p. 848.

prices.³ Simplicity of distribution methods in the Dominican Republic consequently does not signify corresponding economies.

Comparisons of average retail prices of foods common to both

AVERAGE WHOLESALE AND RETAIL PRICES OF SELECTED
DOMINICAN FOODSTUFFS, JUNE 15, 1941^a

Commodity	Unit	Wholesale Price	Retail Price	Spread between Retail and Wholesale Prices	
				Amount	Per cent
Beans.....	100 lbs.	\$ 2.50	\$ 3.00	\$0.50	20
Beef.....	100 lbs.	9.00	12.00	3.00	33
Butter, native.....	Pound	0.20	0.28	0.08	40
Cheese, white.....	Pound	0.09	0.12	0.03	30
Coconuts.....	Dozen	0.18	0.20	0.02	11
Coffee.....	50 kilos.	9.00	11.00	2.00	22
Corn, shelled.....	100 lbs.	1.10	1.50	0.40	36
Eggs.....	Dozen	0.15	0.18	0.03	20
Fish, fresh.....	Pound	0.18	0.20	0.02	11
Flour, corn.....	Pound	0.02	0.03	0.01	50
Goat meat.....	100 lbs.	14.00	15.00	1.00	7
Hog lard.....	100 lbs.	14.50	16.00	1.50	10
Onions.....	100 lbs.	9.00	12.00	3.00	33
Oranges, bitter.....	100 lbs.	0.25	0.33	0.08	32
Peanuts.....	100 lbs.	2.50	3.00	0.50	20
Plantains.....	Per 100	0.60	0.80	0.20	30
Pork.....	100 lbs.	15.00	16.00	1.00	7
Potatoes, sweet.....	100 lbs.	0.70	1.00	0.30	43
Rice (ordinary).....	100 lbs.	4.50	5.00	0.50	11
Salt, refined.....	Pound	0.05	0.06	0.01	20
Sausages.....	Pound	0.14	0.18	0.04	29
Starch.....	50 kilos.	4.00	4.40	0.40	10
Sugar (cream).....	100 lbs.	3.30	4.00	0.70	21
Yams.....	100 lbs.	1.30	2.00	0.70	54

^a Compiled from *Diario del Comercio*, June 18, 1941, giving prices of staple articles prevailing throughout the Republic, from data supplied by the Department of Agriculture, Industry, and Labor.

countries are given in the table on page 192. Nearly all wheat flour is imported into the Dominican Republic, and prices of wheat flour and bread are therefore higher than in the United States. Wheat bread is a luxury. Potatoes are not a common foodstuff in the

³ Profit margins would be small, and no adjustment on this account has been made.

Dominican Republic and prices are therefore high. Lard is higher in the Dominican Republic, in part because of the slaughter tax. Prices of other commodities in the list are lower than in the United States, but in some cases qualities are not comparable. Milk, for example, ordinarily is not pasteurized in the Dominican Republic, and the government has had trouble with adulteration. The low-

UNITED STATES AND DOMINICAN RETAIL PRICES OF SELECTED FOODSTUFFS
(In cents per pound)

Commodity	Dominican Republic ^a	United States ^b
Beef ^c	12	24.2
Bread, white.....	10	7.9
Butter.....	28	42
Cheese.....	12	28.7
Chickens.....	18	33.8
Corn meal ^d	3	4.3
Eggs (per dozen).....	18	36.9
Lard.....	16	12.9
Milk (per quart).....	6	12
Oranges (per dozen).....	12	28.9
Potatoes.....	4	3
Rice.....	5	8.7
Sugar ^e	4	5.8
Wheat flour.....	8	4.5

^a Data are for June 15, 1941, and from *Diario del Comercio*, June 18, 1941.

^b Data are for June 17, 1941, and from *Monthly Labor Review*, September, 1941, p. 773.

^c In the United States, "chuck roast."

^d In the Dominican Republic, "corn flour."

^e In the Dominican Republic, "cream sugar," inferior to United States refined sugar.

priced Dominican cheese quoted is inferior to American cheddar. Better quality Dominican cheese is priced at 25 cents per pound.

Despite the Dominican excise of 1 cent per pound on commercially milled rice, retail prices (5 cents per pound) are well under the usual United States price. Rice is an important foodstuff and a leading article of commerce but, contrary to common belief, it is not a main item of daily food in the way that plantains, sweet potatoes, corn, and yuca are. Rice is a semi-luxury among low-income groups.

The slaughter tax on all meats yielding nearly 1 cent per pound, contributes to raising of Dominican retail prices for beef. Dominican

meat markets do not ordinarily distinguish between different cuts of beef.

The price of butter, like that of lard, is high relative to the general price level of foodstuffs. As shown in the table on page 194, ordinary canned domestic butter—the variety most commonly distributed throughout the Republic—was sold at an average price of 40 cents per pound throughout the period covered by the table. In June 1941, however, domestic butter could be bought at about 28 cents per pound.⁴ This relatively cheap butter appears to have been available only to people in the capital and in a few large towns where refrigeration and distribution facilities were adequate to permit the sale of fresh butter. Butter distributed throughout the country necessarily must be packed in cans, and the price is high, usually running from 40 cents per pound in Ciudad Trujillo to 50 or 60 cents in the more remote parts of the country. The average retail price for butter in the United States from 1936 to 1939 fluctuated between 30 and 40 cents. Imported butter during the same period was sold in the Dominican Republic at about 75 cents per pound. Here again, poor distribution facilities, lack of cooling arrangements, and a high price, puts butter outside the reach of income groups where the greatest need for fats occurs. Due primarily to poor refrigeration facilities, cheese constitutes approximately 82 per cent of milk products and butter 18 per cent;⁵ in the United States, cheese accounts for 23 per cent and butter 77 per cent.⁶

Despite occasional criticism that retail sugar prices of 4 or 5 cents are too high, considering that the Dominican Republic is a sugar-producing country, less fault can be found with this feature of the price structure than with others mentioned. Refined sugar is a luxury food. The artificially high price caused by the excise of 2½ cents per pound is paid by those able to buy refined sugar, and the tax offers a legitimate source of government revenue. Lower-

⁴ The price quoted is presumably for domestic fresh butter in bulk. Prices given in the table for prior years are butter in tin containers.

⁵ Computed from daily production of cheese and butter, farm census of 1940.

⁶ Computed from data for United States butter and cheese production in 1937, *Agricultural Statistics*, 1939, p. 389.

RETAIL PRICES, DISTRICT OF SANTO DOMINGO, 1936-39, 1941^a
(In dollars per pound unless otherwise indicated)

Commodity	1936	1937	1938	1939	1941
FOODSTUFFS					
Avocados (dozen)	0.07	0.08	0.08	0.07	0.12
Bananas (dozen)	0.06	0.05	0.05	0.05	0.06
Beans	0.04	0.04	0.04	0.04	0.03
Beef (dressed)	0.12	0.12	0.12	0.12	0.12
Beef (undressed)	0.10	0.10	0.10	0.10	...
Bread (pound)	0.10	0.10	0.10	0.10	...
Butter (in can)	0.40	0.40	0.40	0.40	0.28
Cheese	0.13	0.14	0.15	0.15	0.12
Chocolate	0.10	0.10	0.10	0.10	...
Coconuts (dozen)	0.18	0.16	0.18	0.18	0.20
Coffee, green	0.07	0.07	0.07	0.06	0.10
Corn (100 lbs.)	1.00	1.00	1.00	1.00	1.50
Eggs (dozen)	0.24	0.24	0.12	0.24	0.18
Flour, corn	0.02	0.03	0.03	0.03	0.03
Flour, wheat	0.07	0.06	0.08	0.08	...
Goat meat	0.15	0.15	0.14	0.14	0.15
Honey (bottle) ^b	0.10	0.10	0.10	0.10	0.08
Lard	0.17	0.18	0.18	0.18	0.16
Limes, bitter (dozen)	0.01	0.01	0.01	0.01	...
Limes, sweet (dozen)	0.04	0.04	0.06	0.04	...
Mangos (dozen)	0.02	0.03	0.02	0.03	...
Milk (bottle) ^b	0.05	0.06	0.05	0.05	0.05
Onions	0.08	0.08	0.08	0.08	0.12
Oranges, bitter (dozen)	0.02	0.02	0.02	0.02	0.03
Oranges, sweet (dozen)	0.06	0.06	0.06	0.06	0.12
Peanuts	0.04	0.04	0.04	0.04	0.03
Plantains (per 100)	0.36	0.45	0.50	0.50	0.80
Pork	0.16	0.16	0.16	0.16	0.16
Potatoes	0.04	0.04	0.04	0.04	0.04
Potatoes, sweet	0.02	0.03	0.02	0.02	0.01
Rice	0.04	0.04	0.04	0.04	0.05
Rum (bottle) ^b	0.31	0.35	0.35	0.35	0.40
Salt (crude)	0.04	0.04	0.04	0.04	0.04
Starch	0.04	0.04	0.04	0.04	0.04
Sugar ("cream")	0.05	0.05	0.05	0.05	0.04
OTHER COMMODITIES					
Charcoal (barrel)	0.25	0.22	0.25	0.25	...
Cigarettes (package of 12)	0.06	0.06	0.06	0.06	...
Cigars, ordinary (each)	0.01	0.01	0.01	0.01	...
Kerosene (bottle)	0.06	0.06	0.06	0.06	...
Matches, box	0.2	0.2	0.2	0.2	...
Men's shirts	0.37	0.40	0.40	0.40	...
Men's suits, blue denim	2.00	2.00	2.00	2.00	...
Men's suits, drill	2.75	2.75	2.75	2.75	...
Rent of house for average family (per month)	6.00	6.00	6.00	6.00	...
Shoes, ordinary, for men (per pair)	1.75	1.61	1.75	1.75	...
Soap, laundry (pound)	0.12	0.14	0.14	0.14	...
Straw hats (each)	0.07	0.07	0.06	0.06	...
Trousers, blue denim	0.53	0.60	0.60	0.60	...
Women's hose, cotton	0.12	0.14	0.14	0.14	...
Women's skirts, ordinary	0.30	0.30	0.30	0.30	...

^a Compiled from *Anuario Estadístico*, 1939, Vol. 2, pp. 463-67. Prices for June 15, 1941 are from *Diario del Comercio* of June 18, 1941.

^b One Dominican bottle equals .739 quart.

income groups buy native "raspadura" sugar, or satisfy sugar needs with honey, fruits, and sugar cane.

Retail prices of staple foodstuffs have remained moderately steady during the last five years, according to officially recorded retail prices compiled and presented by yearly averages in the table on page 194. The price of rice increased from 4 cents per pound to 5 cents in 1941 because of the increase in the excise tax. The rise in coffee prices reflects the new consumption tax. Lard, at 16 cents per pound, is currently lower in price than it has been for several years. Plantains at 80 cents per 100 show what appears to be a seasonal rise in June 1941, although the trend for the past five years has been upward. Salt, production and prices of which are controlled by the semi-governmental salt monopoly, has remained at 4 cents per pound during the past five years. The price trend has been downward in the case of sweet potatoes, significantly one of the most important foodstuffs. Otherwise, prices have remained steady throughout the period covered. Sharp variations in the June 1941 prices of avocados, coconuts, and oranges, as compared with previous years, may be attributed to seasonal influences. Common articles of consumption in the non-food group show almost no change during the period covered. The prices of these articles and of foodstuffs support other indications that the period of 1936-41 was one of remarkable economic stability.

IV. IMPACT OF THE WAR ON DOMINICAN BUSINESS

The effects of the war on Dominican foreign trade and on domestic business have been important, with higher prices outweighing the depressing effects of wartime restrictions. Factors stimulating business, such as the rise in sugar, coffee, and cacao prices in the countries where these commodities are consumed, can be traced to wartime conditions. High prices obtained for cacao and coffee (offsetting the effect of the Inter-American Coffee Agreement allocation in the case of coffee), have increased purchasing power and have produced a strong demand for imported commodities. Even the depressed tobacco industry has finally succeeded in disposing of the 1940 crop, although at low prices.⁷ Minor exports, such as

⁷ Principal buyers were Spain, Spanish Morocco, and Gibraltar. Prices

plantains, other fresh fruits, vegetables, and cattle, are being sold to nearby markets, like Martinique, shut off by the war from ordinary suppliers.

War spending in the United States should result in continued high prices for molasses, cacao, and coffee, whenever deliveries can be made. It is understood that the 1941-42 sugar crop has been sold at a relatively high price. Wartime scarcities may offer profitable opportunities to Dominican producers of minor crops such as castor beans, coconuts (for gas masks), and plants used for extracting essential oils (citronella, lemon grass). Use may be made of Dominican mineral resources such as gypsum and salt. On the whole, the immediate outlook for business in the Dominican Republic was favorable at the end of 1941 although the prospect was somewhat qualified by a shortage of shipping.

averaged 1.6 cents to 4.9 cents per pound. U. S. Department of Agriculture, *Foreign Crops and Markets*, Aug. 11, 1941, p. 152.

CHAPTER XIII

FOREIGN TRADE

An examination of Dominican trade statistics shows that except in 1921, when sugar values collapsed, the value of exports has exceeded that of imports for each of the past 35 years. A part of these export values are of course needed to pay interest and dividends on foreign capital invested in the country. Import totals, too, fall short of the amount which must be paid by Dominican importers to obtain delivery of their goods, since shipping, insurance, and other services are mainly foreign.¹

I. EXPORTS

We will here examine the various commodities which have been sold in world markets and briefly discuss the prospects for the future. Wartime trade controls and the dislocation of established channels are confining market possibilities for exports to narrow areas. Prediction of future marketing possibilities is particularly hazardous at the present time. An examination of prewar outlets for Dominican commodities, however, should give some indication of the direction in which the export trade may be expected to flow. The discussion will deal with three classes of exports—sugar and sugar products, other significant export commodities, and miscellaneous minor products. The table on page 198 gives the average amounts exported, by five-year periods.

A. Sugar

The importance of sugar in the export trade is graphically shown in the chart on page 199. In the five years ending in 1939, the value of sugar exports, including refined sugar, molasses, and other products of the sugar industry, amounted to 65 per cent of the value of all Dominican exports. The value of sugar-industry exports, as a percentage of total exports, ordinarily has remained be-

¹ It has been estimated that about 10 per cent would have to be added to import values to give the approximate *c.i.f.* valuation.

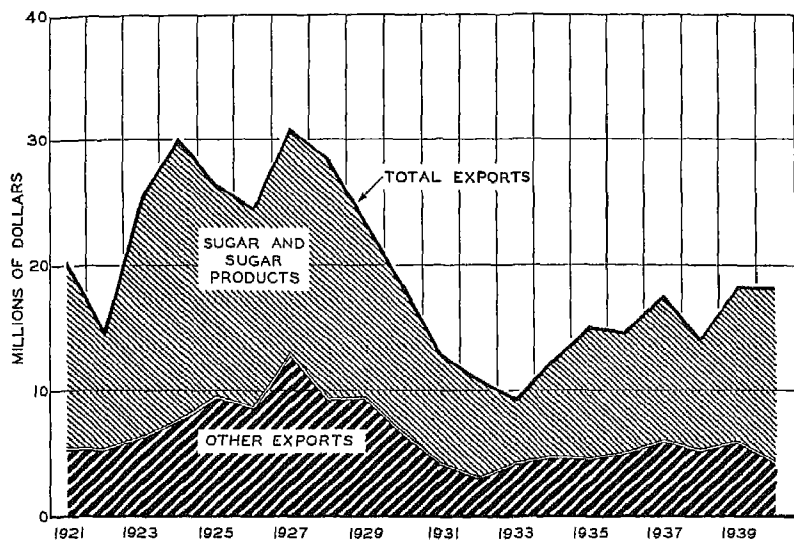
EXPORTS OF PRINCIPAL COMMODITIES BY FIVE-YEAR AVERAGES, 1925-39^a
(In thousands of kilograms unless otherwise noted)

Commodity	Prosperity (Average 1925-29)	Depression (Average 1930-34)	Recovery (Average 1935-39)	Absolute Change		Percentage Change	
				1935-39 from 1925-29	1935-39 from 1930-34	1935-39 from 1925-29	1935-39 from 1930-34
Sugar and sugar products							
Raw sugar	318,353	346,658	433,833	+115,480	+87,175	+36	+25
Refined sugar	2,716	1,180	1,691	-1,025	+511	-38	+43
Sugar cane	194,561	144,748	—	—	—	—	—
Cane molasses	95,927	93,252	102,810	+6,883	+9,558	+7	+10
Cane syrup	—	2,616	5,293	—	+2,677	—	+102
Cacao beans	22,141	21,295	24,516	+2,375	+3,221	+11	+15
Coffee, green	4,223	7,548	11,224	+7,001	+3,676	+166	+49
Tobacco and tobacco products							
Leaf tobacco	16,569	7,918	6,192	-10,377	-1,726	-63	-22
Plug tobacco	—	62	33	—	29	—	-47
Cigarettes (thousands)	33,415	25,795	17,659	-15,736	-8,136	-47	-32
Cigars (thousands)	399	215	32	-367	183	-92	-85
Cattle, live (thousands)	4	5	6	+2	+1	+50	+20
Hides, skins, and leather							
Cattle hides	719	722	684	-35	38	-5	-5
Goatskins	198	135	126	-72	9	-36	-7
Miscellaneous exports							
Corn	8,638	6,416	12,940	+4,302	+6,524	+50	+102
Starch	14	1,303	3,678	+3,664	+2,375	—	+182
Honey	1,171	771	695	-476	76	-41	-10
Beeswax	129	114	211	+82	97	+64	+85
Bananas (stems, thousands)	—	—	264	—	—	—	—
Plantains	1,369	4,113	2,784	+1,415	-1,329	+103	-32
Dried beans	569	534	248	+321	-286	-56	-54
Lignum vitae	2,627	1,953	2,597	-30	+644	-1	+33

^a Compiled from *Sumario de Comercio*, published annually by the Dominican Receivership of Customs. Data for 1926 are from *Estadística Estadística*.

tween 60 and 65 per cent during the past 15 years, indicating that no progress has been made in developing other export products. In 1940 the percentage of sugar-industry exports to total exports jumped to 74 per cent because of the rise in sugar prices combined with an increase in sugar exports and a decline in others.

TOTAL EXPORTS AND SUGAR EXPORTS, 1921-40^a



^a For data see p. 203.

The Dominican Republic obtains its power to buy imports from: (1) the sale of export products other than sugar-industry products, amounting in value to an average of \$5,600,000 annually; and (2) amounts paid by the sugar industry into the Dominican economy in the form of pay rolls, taxes, purchases of cane from private producers, purchases of miscellaneous other domestic raw materials such as lime and firewood, and payments for various services.

Because sugar manufacturing involves the large-scale investment of capital, operations do not vary as much as sugar prices, sugar quotas, and the values of the industry's output. Total payrolls remained relatively constant in the three years ending with 1939,

during which the value of sugar exports fluctuated substantially, as shown in the figures below (in millions of dollars).

Year	Sugar-Industry Pay Rolls	Exports of Sugar and Sugar Products
1937	4.9	11.6
1938	4.7	9.4
1939	4.9	12.2

Most of the cane used by the Dominican centrals is produced on company-owned plantations. Pay rolls and taxes are therefore the chief index of purchasing power released by cane production and sugar-milling operations. The chief contribution made by the sugar industry to the economy of the Republic is this relatively steady year-by-year payment of wages and taxes, amounting together to more than \$6,000,000 annually. These payments are a leading factor in the economy. Changes in sugar prices and quotas mean wide variations in the earnings of the companies and in the amounts paid to creditors and stockholders, mostly foreign,² but the Dominican Republic in general does not feel greatly the effects of falling sugar prices, nor of smaller sugar quotas, until marginal producers are compelled to suspend operations. Several small sugar centrals were forced out of operation at the beginning of the 1929 depression, and others dropped out in the next few years until the number of centrals fell from 21 to 13. The closed mills were the small and inefficient centrals, and the loss was not severely felt because the stronger companies meanwhile had been steadily increasing sugar-cane acreage, as shown in the table on page 201. The number remained at 13 until 1938, when a fourteenth mill began operations. Sugar-cane acreage from which cane is produced for the centrals, as shown in the table, has expanded since the depression low, and the figure of 212,000 acres for 1939 was greater than that for the late twenties. Sugar quotas have not influenced the production of sugar cane, partly because mills have compensated for

² The Chardón report estimates the percentage of Dominican interests in the sugar industry at 10.9. (*Reconocimiento* . . . (1937).) A government study (preliminary) of the international balance of payments states, with regard to the sugar industry: "There are thirteen centrals in operation, each of which may be considered entirely foreign."

lower sales of sugar in the world market by producing more molasses and less sugar. The effect of these factors has been to stabilize cane production and the amount of money paid into the Dominican economy in the form of wages, taxes, and miscellaneous purchases of domestic products.

SUGAR-CANE ACREAGE OF DOMINICAN CENTRALS FOR SELECTED YEARS,
1923-39^a

(In thousands of acres)

Centrals	1923 ^b	1927	1929	1931	1933	1935	1938	1939
La Romana	27.5	37.0	39.4	47.5	45.0	55.6	60.5	55.8
Santa Fe	12.9	19.4	20.6	20.4	17.0 ^c	2.15	23.5	28.0
Consuelo	20.0	31.3	29.0	31.5	35.0	26.4	35.5	33.3
Barahona	16.0	13.0	14.8	16.5	18.7	16.7	13.7	20.0
Quisqueya	10.1	17.9	13.4	14.7	13.5	15.3	16.5	18.1
Las Pajas	5.7	9.4	7.0	9.0	6.6	8.3	7.5	9.7
Monte Llano . . . . .	.3	2.9	—	2.4	4.2	7.2	4.0	4.6
Angelina	6.2	9.4	9.7	5.1	7.6	8.0	8.0	8.6
Cristóbal Colón	5.1	7.3	7.0	4.7	4.0 ^c	6.0	6.5	6.6
Italia	9.3	10.0	8.3	7.4	5.0	6.6	7.0	7.1
Boca Chica	7.7	5.8	8.0	5.0 ^c	6.1	7.3	7.8	9.9
Porvenir	7.7	10.5	8.7	12.3	10.0	7.2	8.4	9.2
Amistad . . . . .	.3	1.0 ^c	1.0	.6	.6 ^c	1.0	.6	1.1
Others	18.1	20.0	16.7	12.1	—	—	—	—
Total	146.9	194.9	183.6	189.2	173.3	187.1	199.5	212.0

^a Crop year ending in year specified. Computed from data in *Anuario Estadístico de la República Dominicana*, 1937 and 1939.

^b Dominican Customs Receivership, *Report of the Seventeenth Fiscal Period . . . 1923 (1924)*, p. 11.

^c Estimated.

The stability of sugar-industry operations, relative to the value of product, is shown in detail in the table on page 202.

Raw sugar is sold mostly to the United Kingdom and Eire. The United States, France, Morocco, the Netherlands, New Zealand, Japan, and Egypt have been among other buyers. Sales to the restricted United States market have been made possible by the annual raw sugar quota allotted to the Dominican Republic, and through sales to the United States in bond for refining and export. From 10 to 15 per cent of Dominican raw sugar exports are ordinarily sold in the United States market. Future opportunities for selling sugar naturally depend upon wartime developments.

COSTS AND VALUE ADDED IN MANUFACTURE OF SUGAR, 1937-39^a
(In thousands of dollars)

Year	Cost of Materials ^b		Cost of Containers ^c		Cost of Fuel, Lubricants, and Electrical Energy			Total Cost (Not including labor)	Salaries and Wages	Value of Product	Value Added by Manufacture ^d
	Domestic	Foreign	Domestic	Foreign	Fuel	Lubricants	Electricity				
1937.....	4,372	2	—	602	328	52	146	5,502	4,907	11,107	5,605
1938.....	4,390	1	—	518	300	56	126	5,391	4,653	9,807	4,416
1939.....	4,417	59	—	623	318	68	149	5,634	4,910	11,803	6,169
Average...	4,393	31	—	581	315	59	140	5,509	4,823	10,906	5,397

^a Compiled from *Anuario Estadístico*, 1937, 1938, and 1939, Vol. 2.

^b Chiefly sugar cane.

^c Chiefly jute bags.

^d Value of products less cost of materials, containers, fuel, lubricants, and purchased electricity.

There is little prospect that the United States will permanently become a more important buyer except as a refiner and exporter. Molasses is sold entirely in the United States, and profitably at present prices.

Exports of commodities other than sugar-industry products constituted 35 per cent of the total value of exports during the five years

EXPORTS OF SUGAR PRODUCTS AND OF ALL OTHER COMMODITIES, 1920-40^a
(In thousands of dollars)

Year	Raw Sugar	Re- fined Sugar	Mo- lasses	Sugar Cane	Cane Syrup	All Other Commod- ities	Total Exports
1920	45,306	230	170	205	—	12,488	58,399
1921	14,338	—	128	170	—	5,569	20,205
1922	9,192	8	93	133	—	5,449	14,875
1923	18,723	11	121	187	—	6,582	25,624
1924	21,683	4	415	383	—	7,613	30,098
1925	15,447	5	731	691	—	9,710	26,584
1926	14,700	—	560	646	—	8,745	24,651
1927	16,668	—	528	632	—	13,171	30,999
1928	16,912	798	619	774	—	9,425	28,528
1929	12,259	33	689	931	—	9,551	23,463
1930	9,910	257	745	743	—	6,659	18,314
1931	7,584	17	924	60	—	4,345	12,930
1932	6,860	9	441	550	—	3,074	10,934
1933	4,398	4	511	351	—	4,161	9,425
1934	6,742	14	592	148	56	4,857	12,409
1935	9,442	34	832	—	61	4,702	15,071
1936	8,509	60	985	—	116	5,038	14,708
1937	10,681	57	844	—	57	6,132	17,771
1938	8,582	72	616	—	86	5,219	14,575
1939	11,804	77	242	—	88	6,065	18,276
1940	12,883	199	547	—	62	4,359	18,050

^a Compiled from *Estudio Estadístico de Algunos Aspectos del Comercio Exterior de la República Dominicana, 1920-1939*, published by National Statistics Office in 1941, pp. 108-11.

ending in 1939. This compares with 37 per cent in the preceding five years, and 38 per cent in the pre-depression period of five years ending in 1929. Products other than those from sugar are therefore becoming relatively less important, as can be seen from the table above. Factors contributing to the growing dominance of sugar are: (1) the rising trend of sugar-cane acreage, rising sugar and molasses production, and, recently, higher sugar prices;

(2) generally lower prices for coffee, offsetting the substantial increase in coffee production; and (3) the downward trend of tobacco exports and lower tobacco prices.

B. Other Significant Export Commodities

Coffee. In the last ten years the Republic has nearly tripled its production of coffee for export.³ The increase was fastest in the period 1930 to 1934, but it has continued throughout the thirties. It should be recalled that coffee for many years has been a surplus-production crop, and that this commodity was one of the worst victims of mid-depression destruction of commodity values. Recovery in coffee prices was slow, and a serious set-back took place in November 1937, when artificial support given to world coffee prices by Brazil was dropped. Although wartime demand for coffee, attributable to the shipping shortage, has recently lifted coffee prices to higher levels, the imposition of quota restrictions has counteracted the benefit of higher prices. Over the period of expanding Dominican coffee production, the tripling of exports in terms of quantity has served only to keep the value of coffee exports about where it was in the pre-depression years.

It is unfortunate that the Republic has counted heavily on a commodity which has one of the worst price records. Dominican coffee does not enjoy trade preferences in the foreign markets where it is sold, a high-premium quality product has not been developed, and relatively higher wages and production costs in the Dominican Republic make it difficult for Dominican coffee to compete with the product of other countries. The difference in costs is made up in part by charging no taxes or export duties on coffee exports.

The Inter-American Coffee Agreement, signed on November 28, 1940, has been ratified by the Dominican Republic. The original quota allocations under the agreement, in round numbers, and exports for various periods, are shown in the table on page 205.

Although the Dominican coffee allocation has been characterized as satisfactory, it is evident that the sale of quantities approaching the total amount available for export will be contingent upon access to continental European markets where most of the Dominican crop has been sold in the past.

³ See table on p. 130.

France, in normal times, bought from 40 per cent to 60 per cent of the crop. Other leading buyers were the Netherlands, Germany, Sweden, and Spain. The United States became an important buyer in 1936, taking 15 per cent of the crop and increasing its share to 24 per cent in 1939. Present prices are high, but quota restrictions make it difficult for Dominican producers to take full advantage of the strong United States demand. Non-quota coffee must be stored or sold in the few remaining markets. Surplus world production has made coffee hard to market, and the uncertain out-

DOMINICAN COFFEE EXPORTS COMPARED WITH QUOTA FOR 1941
(In thousands of kilograms)

Year	Average Annual Exports of Dominican Coffee	Dominican Quota Allocation*		
		Total Allocation	U. S. Market	Other Markets
1925-29.....	4,223	—	—	—
1930-34.....	7,548	—	—	—
1935-39.....	11,224	—	—	—
1940.....	8,567	—	—	—
1941.....	—	15,500	7,200	8,300

* J. Barnard Gibbs, "The Inter-American Coffee Agreement," *Foreign Agriculture* (published by U. S. Department of Agriculture), April 1941, p. 167.

look for coffee in normal times is aggravated by the closing of European outlets. Dominican coffee has not enjoyed an established place in any foreign market except in France.

Cacao. Exports of cacao usually are second in importance to sugar-industry products in terms of value, although the coffee crop occasionally has taken second place, as in 1932 and again in 1936. The annual cacao crop, as measured in terms of quantities exported, has varied less in size than the coffee, tobacco, and other export crops. The smallest quantity of cacao exported in the last decade was in 1936, when exports were reduced to 18.2 million kilograms because of drought.⁴ Usually, exports amount to about 22 million kilograms, and in 1938 a high for the past decade of 28.4 million kilograms was reached. Exports in the five-year recovery period ending in 1939 increased in quantity by 11 per cent from the corresponding pre-depression period (1925-29) and by

⁴ Dominican Customs Receivership, *Report of the 30th Fiscal Period . . . 1936* (1937), p. 34.

15 per cent from the five-year mid-depression period (1930-34). In value, exports in the recovery period were 19 per cent greater than those in the mid-depression years, but 57 per cent under the average annual value of cacao exports in the pre-depression period.

The cacao export trade, like coffee, has failed to recover noticeably from the depression, except that in 1936 and 1937 Dominican exporters benefited from a moderate rise in prices, which was wiped out, however, in the 1938 recession. With deliveries of West African cacao threatened by the shipping shortage, prices have moved upward. Accra cacao was quoted at 7.7 cents per pound in July 1941, as compared with 4.6 cents in the same period a year before, but prices are still far from the 1937 average of about 12.9 cents per pound, or the pre-depression level of more than twice that amount. Dominican cacao prices are currently quoted in New York at about 12 per cent under prices for the Accra variety. Dominican "ordinary" cacao, commercially known as "Sanchez" cacao in the New York market, is usually quoted at prices about 50 per cent under the grades classified as "fine." The so-called "fine" cacaos are grown chiefly in Venezuela, Costa Rica, Ecuador, Surinam, the British West Indies, Ceylon, and Java.

Dominican cacao is in a stronger market position than coffee. World cacao production, unlike coffee, has not suffered from years of attempted artificial control over prices and production. Only 35 per cent of world production is supplied by countries of the Western Hemisphere, while the United States absorbs about 40 per cent of the world supply. The supply of low-grade cacaos from Latin America is said to have fallen considerably below the rate of consumption in the United States.⁵ Cacao is adaptable to a wider variety of uses than coffee, which adds to its long-range possibilities. The Dominican Republic may benefit from the short haul to the United States in the event of a serious shipping shortage. From a marketing standpoint, cacao seems better suited to a program for increased production in the Dominican Republic than coffee.

In recent years cacao has been sold almost entirely in the United States. The commodity is found on the United States' free list under various trade agreements. It may be expected that the United

⁵ B. C. Merdian, "World Cacao Production and Trade," *Foreign Agriculture*, February 1941, p. 33.

States will continue to offer the best outlet for this commodity. The possibility that the shipping shortage may shut off important West African supplies is a factor which adds to the prospects of a strong United States demand.

Tapioca (yuca starch). This is a new product, with quantity production beginning in 1931. Exports have increased from 722,000 kilograms in that year to 11.5 million kilograms in 1939.⁶ Shipments dropped off in 1940 to 6.4 million kilograms. The shutting off of Far Eastern sources of tapioca by the shipping shortage was expected to bring about a wartime expansion of the local industry, but the boom has not materialized.

Tobacco. Production of tobacco for export is a declining industry. In quantity, leaf tobacco exports dropped by 63 per cent in the mid-depression period (1930-34) from the pre-depression years (1925-29). The decline continued in the five years ending in 1939, when exports fell by 22 per cent from the mid-depression average to an annual average of only 6.2 million pounds. The latter figure compares with annual average exports of 16.6 million pounds in 1925-29. The value of the export crop fell from an annual average of nearly \$2,000,000 in the pre-depression period, when it was more valuable than the coffee crop, to an annual average of \$335,000 during the five years ending in 1939. In 1940 the value of tobacco exports sank to \$96,000.

Loss of the European market for leaf tobacco has thus far been the most serious single effect of the war on Dominican export industries. Between 50 per cent and 70 per cent of Dominican export tobacco was taken by Germany and the Netherlands in the years before the war, and remaining exports were sold almost entirely in other European countries, chiefly France and Belgium. An exportable surplus of 18,761,000 pounds of leaf tobacco was reported on hand at the beginning of 1941.⁷ Apparently Spain, Spanish Morocco, and Gibraltar bought most of the 1940 carry-over,⁸ but at ruinously low prices, ranging from 1.6 cents to 4.9 cents per pound. Prices at port of shipment averaged between 4 and 5 cents per pound in

⁶ The 1939 figure, however, represents largely the shipment of accumulated stocks rather than the production for that year.

⁷ U. S. Department of Agriculture, *Foreign Crops and Markets*, Feb. 24, 1941, p. 260.

⁸ The same, Aug. 11, 1941, p. 152.

recent years at a time when prices for United States export tobacco ranged between 32 and 35 cents per pound.*

The outlook for re-establishing Dominican tobacco exports while the war lasts is not promising. It is evident that producers have failed to build up a quality product for which there is a demand for special purposes. In such a highly competitive industry with the advantage of volume production already lost, the prospects of regaining export position are discouraging. Immigrant farmers interested in tobacco might endeavor to supply the local market with the small quantities of tobacco of a special type now imported, although technical agricultural problems present serious obstacles.

Corn. The Dominican Republic from time to time becomes an exporter of corn when world price conditions and surplus domestic supplies favor shipment. Exports have doubled in quantity in recent years when comparison is made with mid-depression shipments of about 6,400 metric tons annually. Average annual shipments of 12,900 metric tons in the five years ending in 1939 were also greater than the pre-depression (1925-29) average annual exports of 8,600 metric tons. Exports in 1940 totaled 10,800 metric tons.

In value, annual exports averaged \$252,000 in the 1935-39 recovery period, compared with \$137,000 in the best mid-depression year. The export trade in corn, however, should be looked upon simply as a surplus-disposal industry of no primary interest to immigrant farmers.

Bananas. The banana trade, while still a relatively small export industry, is important because of its potentialities. With haphazard buying methods and no organized production on a plantation scale, banana exports increased in three years to 824,000 stems in 1939, valued at \$190,000. Exports fell off in 1940 to 693,000 stems. The Republic of Haiti, with better-organized production and marketing, built up its present banana industry in six years to the point where nearly 3,000,000 stems, valued at about 1.5 million dollars, were exported in 1941.

Bananas are now sold in quantity only in the United States market. There are no prospects of developing a more favorable

* *Statistical Abstract of the United States*, 1939, p. 328—unit values of leaf tobacco exports (United States) per pound, 1935 to 1938.

outlet. Buying, shipping, and marketing facilities at destination have been organized by the fruit companies to a point where producers have no choice other than to sell their output to the few companies engaged in the international banana trade. The existence of the broad United States market for bananas, nearness of the Dominican Republic to this market, and the availability of highly organized marketing facilities, are important factors in making banana cultivation one of the best prospects for development as an export crop.

Recent land purchasing activities of the United Fruit Company in the Monte Cristi region point to the possibility of a renewal of banana cultivation by that company in the Dominican Republic. New problems in the control of diseases affecting banana plants which have developed since the company previously operated in the Republic have increased the relative advantage of large-scale plantation production of the fruit, using elaborate irrigation and spraying methods.

Other products. Exports of plantains to neighboring markets have averaged between \$40,000 and \$80,000 in value. The table on page 198 shows a decline in the volume of exports since 1930-34.

Honey is produced primarily for local consumption. Surpluses are exported to continental European countries and the United States. The closing of these markets reduced Dominican exports to \$9,000 in 1940 from average yearly exports of \$35,000 in the five previous years. The United States offers a very limited market, having bought honey from all foreign suppliers valued at an average of only \$21,000 annually in 1937, 1938, and 1939, despite duty reductions accorded under the trade-agreements program. The preferential duty reduction accorded to Cuba makes it doubtful that Dominican honey can compete in the United States market unless it is sold as a de luxe, quality product in conjunction with an expensive merchandising campaign.

Beeswax exports have doubled in quantity in the recovery period (1935-39) compared with the mid-depression period (1930-34), suggesting that Dominican consumption of honey has increased, since honey exports have declined. Although beeswax does not have the limited market prospects of honey, since it is sold for industrial uses in the broad United States market, it is of no interest

to the immigrant farmer except as a by-product of honey.

Lignum vitae is the chief export commodity of the forest-products industry, but shipments average only about \$70,000 annually. Immigrants may be able to make small shipments of lignum vitae and other forest products obtained from the land being cleared for farming.

Live animals, particularly cattle and chickens, are becoming important items on the list of exports. About 4,000 head of cattle were exported annually in the pre-depression years. In the 1930-34 period annual exports averaged 5,000 head, and in the five years ending in 1939 average annual exports rose to 6,000 head. In 1940, cattle exports totaled 5,573 head, valued at \$129,000, and exports of chickens were valued at \$71,000. Cattle hides and goatskins were exported in smaller quantities than usual in 1940. Exports were valued at \$81,000 in that year, of which the sum of \$50,000 represents the value of cattle hides exported. Average exports in the five years ending in 1939 were valued at \$182,000.

To summarize, exports from industries other than sugar consist chiefly of cacao, coffee, and tapioca, with gold, corn, bananas, and cattle comprising the greater part of the balance. The relative importance of the main groups of non-sugar exports was as follows, in terms of value, in 1940:

	Amount	<i>As Percentage of Total</i>
Cacao	\$1,617,000	35
Coffee	770,000	16
Tapioca	524,000	11
Placer gold	242,000	5
Bananas	152,000	3
Cattle	129,000	3
Leaf tobacco	96,000	2
Beeswax and honey	87,000	2
Cattle hides and goatskins	81,000	2
Live chickens	71,000	2
Corn	175,000	4
Other non-sugar exports	695,000	15
Total	\$4,639,000	100

C. Miscellaneous Minor Products

The minor Dominican export products shown in the table on pages 211-12 represent, for the most part, occasional shipments of

MINOR DOMINICAN EXPORTS, 1929 AND 1939^a

Commodity Exported	Quantity (In kilograms)		Value (In dollars)	
	1929	1939	1929	1939
ANIMAL PRODUCTS				
Cheese.....	6,725	2,182	2,942	504
Eggs.....	200	26,612	62	4,417
Meats, fresh, salted, pickled, and canned.....	—	7,563	—	1,197
Cattle horns and hoofs.....	575	6,853	50	256
Tallow.....	2,646	15	230	5
Manures, animal.....	718,318	—	2,200	—
VEGETABLE PRODUCTS				
Fruits				
Fresh fruits, unspecified.....	430,622	1,465,950	9,219	26,657
Avocados.....	—	85,018	—	956
Limes.....	334	17,356	5	473
Ginger.....	133	1,749	8	49
Oil seeds, vegetable oils, and oil cake				
Peanuts.....	25,562	2,652	3,047	150
Peanut oil.....	—	40	—	5
Peanut cake.....	—	759,108	—	16,819
Coconuts and copra.....	5,781	116,226	263	3,736
Coconut oil.....	887	358	137	63
Sesame.....	—	387	—	36
Vegetables				
Cabbage.....	—	19,761	—	638
Cassava.....	2,396	203	164	6
Chayotes.....	295	2,102	12	40
Garlic.....	—	14,381	—	1,942
Garbanzos, or chick-peas.....	—	14,956	—	993
Gandules, or pigeon peas.....	301,346	23,013	33,109	955
Horse beans.....	1,317	1,170	145	58
Potatoes.....	—	49,620	—	1,820
Pumpkins.....	15,312	16,520	513	441
Sweet potatoes.....	20,278	317,373	444	4,999
Tomatoes.....	—	7,710	—	553
Vegetables, not otherwise specified.....	—	11,049	—	330
Yams.....	2,820	54,943	70	1,022
Yautias.....	714,812	469,377	17,527	7,716
Yuca.....	—	1,118	—	17
Vegetable fibers				
Cotton.....	16,108	221,020	4,808	11,669
Vegetable fibers, not otherwise speci- fied.....	3,630	200	103	8
Sisal.....	12,198	—	2,146	—
Grains and feeds				
Bran.....	178,898	879,336	6,699	18,489
Feeds for animals, unspecified.....	—	323,007	—	6,051
Corn flour.....	—	66,605	—	1,549
Dyeing and tanning materials				
Divi-divi.....	491,315	1,019,702	11,067	16,612
Anatto.....	2,310	38,976	483	3,271
Logwood.....	250,771	2,000	2,709	16
Miscellaneous vegetable products				
Charcoal.....	—	480,402	—	3,060
Firewood.....	122,863	67,074	165	80

MINOR DOMINICAN EXPORTS, 1929 AND 1939^a—Continued

Commodity Exported	Quantity (In kilograms)		Value (In dollars)	
	1929	1939	1929	1939
Resins.....	19,701	8,768	10,207	1,485
Seeds, unspecified.....	29,723	41,499	632	237
Marjoram.....	6,051	1,099	937	92
WOOD				
Wood, unmanufactured ^b				
Bera (bastard lignum vitae).....	1,846,650	672,930	41,831	13,037
Mahogany.....	1,072,078	287,211	37,700	11,190
Baitoa.....	266,243	566,410	3,389	4,935
Pine.....	3,780	621,080	53	9,908
Cedar.....	2,458	28,706	213	1,781
Caracoli.....	—	39,738	—	1,159
Lancewood.....	434,244	67,582	5,036	970
Sawmill products				
Railroad ties.....	4,170,947	772,965	40,524	5,129
Posts and prepared woods.....	194,374	606,083	1,679	2,863
Wood manufactures				
Furniture.....	2,261	21,479	1,008	4,648
Shooks.....	143,663	—	7,929	—
MANUFACTURED PRODUCTS				
Printed matter, photographs, etc.....	350	1,731	20	6,599
Chocolate.....	—	36,947	—	6,525
Liquors and beverages, unspecified (liters).....	70	13,248	14	2,481
Medicinal preparations.....	—	2,928	—	2,202
Slippers and mules (pairs).....	—	1,500	—	522
Hats (number).....	—	995	—	151

^a Compiled from *Sumario de Comercio*, published annually by Receptoría General de Aduanas. Includes all commodities not listed in the table on page 198, except items of negligible importance.

^b All classifications valued at \$500 or more.

typical Dominican products sold to nearby markets when special demand-supply situations offer opportunities. At the present moment, for example, there is a thriving trade in live cattle and fresh fruits and vegetables to nearby islands, such as Martinique and Guadeloupe, shut off from normal sources of supply. In a few instances, however, the data show that small foreign markets have been built up for specialties, such as manufactured chocolate. These small items suggest the size of the export trade which the immigrant colony might expect to build up through production developed along similar lines.

Comparing the two periods (1929 and 1939) shown in the table, exports have increased substantially in the case of miscellaneous

fresh fruits, peanut cake, coconuts, garlic, potatoes, sweet potatoes, yautias, cotton, bran, divi-divi, charcoal, pine lumber, furniture, chocolate, liquors, and medicinal preparations. Excluding cotton and divi-divi, exports of which were valued in 1939 at \$12,000 and \$16,600 respectively, the individual items in each case amount to no more than a few thousand dollars.

Items which in the past ten years have disappeared from the list of exports, or which have fallen off substantially in importance, are logwood, mahogany, railroad ties, bera (bastard *lignum vitae*), resins, and sisal. Small exports of cheese, tallow, animal manures, peanuts, and pigeon peas also were recorded in 1929, but had fallen off in 1939. Cheese exports, however, have picked up again because of the shortage in the United States of certain kinds of cheese formerly supplied by Italy.

It is worthy of note that potatoes to the value of \$10,000 were exported in 1940, compared with only \$2,000 in 1939.

D. Factors Affecting Export Possibilities

There are various factors which will affect the opportunities for expanding exports in the future. The Dominican Republic is not the principal supplier of any important export commodity to any foreign market, nor does it have treaty arrangements with any country which gives it valuable trade preferences.

Most tropical agricultural countries with which the Dominican Republic competes for foreign markets produce one or more specialty commodities which enjoy a preferred place in the buying countries: sugar (Cuba); sisal and logwood (Haiti); bananas (Honduras); quality coffees (El Salvador, Guatemala, Costa Rica); fresh pineapples (Mexico); off-season vegetables (Cuba). Other nearby competing areas enjoy trade preferences because of political ties; for example, the Empire trade preferences granted to British colonies, and the preferential tariff concessions granted Cuba by the United States. Trade-agreement concessions granted by the United States to various countries competing with the Dominican Republic are of doubtful value to the Republic, although the trade benefits apply equally to it because of the most-favored-nation privileges which it enjoys.

Important Dominican export commodities such as cacao, coffee, and bananas are on the United States free list. Sugar, except for a small quota allotment, is excluded by United States sugar legislation (the Sugar Act of 1937). All Cuban exports to the United States benefit not only from duty reductions in many cases, which apply equally to Dominican exports, but from further duty preferentials under which all United States imports of Cuban products are dutiable at rates 20 per cent (40 and 50 per cent in the case of certain commodities) lower than those applicable to the same products of other countries.

The Dominican Republic is the only country in the entire Caribbean area without special trade advantages or without specialty commodities of the kind mentioned. This fundamental weakness in the trade position of the Republic points to the need of developing one or more specialty products for export. The Dominican Republic cannot compete successfully, and on a larger scale, in the production of coffee, cacao, bananas, and similar tropical commodities sharing the world market because its wage rates are higher than wage rates of countries which are the chief producers of these commodities. Dominicans and the new colony of immigrants alike can achieve a higher standard of living by producing specialty products for export and developing new processes and refinements of method rather than by attempting to produce greater quantities of low-wage tropical commodities of which there is already a world surplus.

The immediate outlook for possible new trade outlets is not bright. As long as the war lasts continental European markets will presumably remain closed, and exports can be sold only to the United States and Puerto Rico. Some Dominican surplus commodities, such as plantains and rice, may continue to find limited markets in other nearby islands, such as Martinique, whose normal source of imported food supplies has been cut off. For the most part, however, Dominican products and those of the other American republics (except the United States) are not complementary to each other.

Regardless of the duration or outcome of the war, a general lowering of trade barriers which would open up European markets

cannot be anticipated. Efforts to develop export industries should therefore be directed with a view to selling in the nearby United States market or in Puerto Rico.

II. IMPORTS

We will first examine Dominican imports by types of commodities, noting the effect of the government self-sufficiency program. This will be followed by a short analysis of the sources of imports.

A. Classes of Imports

The average value of imports,¹⁰ by classes, for periods from 1927 to 1940 are given below in thousands of dollars.

Economic Classes	Prosperity (Average 1927-29)	Depression (Average 1930-34)	Recovery (Average 1935-39)	1940
Live animals	8	6	15	
Foodstuffs and beverages	7,141	2,597	1,632	
Raw materials and semi-manufactures	2,906	1,307	1,123	
Manufactured products	15,712	6,704	8,099	
Total imports	25,767	10,614	10,869	10,511

Foodstuffs. Imports of foodstuffs in the 1935-39 period declined by 72 per cent from the corresponding pre-depression average. Some of the decline is attributable to lower prices, but the government self-sufficiency program, particularly the development of the domestic rice industry, is the most important factor.

Raw materials and semimanufactures. This class of imports, consisting chiefly of mineral oil, cement, lumber, chemical fertilizers, raw tobacco, and similar products, fell off, in value, by about 60 per cent between the pre-depression period and 1935-39. Gasoline consumption has recovered in recent years to nearly the pre-depression level, with prices for this and other petroleum products far under those of 1929. Cement imports, which serve as a gauge of building activity, are still about 10 per cent under the 1929 level in volume,

¹⁰ Dominican statistics show the foreign valuation of goods imported. It has been estimated that about 10 per cent should be added to give the c.i.f. value, or value which importers must pay foreign suppliers.

with prices in 1939 slightly higher than they were ten years previously. Imports of lumber, formerly an important item, have nearly disappeared as a result of the government's program for the development of forest resources.

Manufactured products. Finished goods, imported chiefly from the United States, show the only change contrary to the general downward trend of the other principal groups. In value, imports of manufactured articles, 50 per cent of which consist ordinarily of cotton goods, increased by 20 per cent from the mid-depression years, compared with declines of 38 per cent and 14 per cent respectively for the foodstuffs and raw materials groups. The average total value of imported manufactured articles in the recovery period was at about half the pre-depression level; but with the general decline in prices, the physical volume of imported articles had returned in 1939 to about the level of 1929.¹¹

The self-sufficiency program has been remarkably successful. Imported foodstuffs have been replaced by increased domestic production of rice and other domestic foodstuffs. Formerly heavy imports of rice have disappeared, and since 1939 the Republic has been a rice-exporting nation. Wheat flour and fish imports have been cut in half. Lard and table oil imports, in volume, are at about one-third the pre-depression level. Butter, condensed milk, and alimentary pastes, formerly important items, are now imported only in small quantities. Cheese, sausages, and wines are still imported for the luxury trade, but in much smaller quantities.

These changes evidently have not been accomplished at the expense of decreased consumption of staple foodstuffs, except possibly in the case of fish. Expansion of dairying has brought about decreased imports of cheese, butter, and condensed milk. Six alimentary paste factories (using imported wheat, it is true) supply most of the domestic needs. Peanut oil is replacing imported edible oils. Rice production not only has replaced imports, but domestic rice utilization has steadily increased, as is shown in the table on page 217.

A recent publication of the United States Department of Agri-

¹¹ This observation is confirmed by *Estudio Estadístico*, p. 45.

PRODUCTION, TRADE, AND DOMESTIC CONSUMPTION OF RICE, 1927-41^a
(In thousands of pounds)

Year	Production of Milled Rice	Imports	Exports	Apparent Domestic Utilization
1927	7,480	68,026	—	75,506
1928	13,090	62,420	—	75,510
1929	16,500	61,267	—	77,767
1930	24,860	48,220	—	73,080
1931	39,820	38,571	—	78,391
1932	40,367	25,466	66	65,767
1933	59,352	32,032	—	91,384
1934	63,800	26,439	—	90,239
1935	70,400	20,847	—	91,247
1936	76,369	19,959	—	96,328
1937	80,027	4,110	—	84,137
1938	91,805	14,746	—	106,551
1939	90,435	1,129	3	91,561
1940 . . . . .	...^b	2	824	...
1941 . . . . .	...^c	—	1,062 ^d	...

^a Adapted from U. S. Department of Agriculture, *Foreign Crops and Markets*, Aug. 4, 1941, p. 122.

^b About the same as in 1939.

^c A much larger crop is indicated than in 1940.

^d For four months, January-April.

culture thus describes the measures taken by the government to encourage domestic rice production:

... Dominican rice producers have been protected by an import tariff of \$1.25 per 100 pounds since 1920. The quantity then grown was extremely small, but it soon became evident that rice could be produced in larger volume within the country, and, with the Government advocating increased production, the acreage expanded rapidly. As domestic production increased, additional internal revenue tariffs were imposed on imported rice. Successive additional rates were imposed from 1935 to 1939 until the total import duty amounted to \$2.27 per 100 pounds.

At the present time a tax of \$1.00 per 100 pounds is levied on all commercially milled rice produced in the country. This tax is collected from the wholesale rice buyers at the hulling mills. In 1935 a law was enacted providing for the refund of 95 per cent of this tax on all Dominican rice exported. For the purpose of keeping a strict control on rice exports the Government requires that all such exports should be by licenses granted by the Treasury Department prior to shipment. This is aimed at insuring that at no time should exports be allowed to

deplete the rice stocks to such an extent that there might not be a sufficient supply for consumption within the country.¹²

The self-sufficiency program has been extended to manufactured products in the case of a few items, notably soap and nails. Here the effectiveness of domestic production in achieving self-sufficiency is questionable, since raw materials have to be largely imported. However, imports of soap have declined from 2,700 metric tons in 1929 to 209 metric tons in 1939. It is probable that increased vegetable oil production will soon make it possible to use more domestic materials for soap-making.¹³

IMPORTS OF TEXTILES AND WEARING APPAREL, 1929, 1939

Material Imported	1929		1939	
	Amount (In thousands of dollars)	As Per- centage of Total	Amount (In thousands of dollars)	As Per- centage of Total
Textiles (chiefly cotton)	3,080	14	2,021	18
Wearing apparel ^a	1,868	8	1,068	9
Thread and yarn	288	1	207	1
Total	5,236	23	3,296	28
All other commodities	17,493	77	8,296	72
Total imports	22,729	100	11,592	100

^a Including hats valued at \$146,700 in 1929 and at \$60,700 in 1939.

Cotton goods and wearing apparel comprise by far the largest group of closely related imported articles. The predominance of the group in the import trade has become even more evident now that foodstuffs and certain manufactures formerly imported are being produced by domestic industries. The self-sufficiency program has made no progress in developing domestic substitutes for imported textiles and wearing apparel, as shown in the table above.

Shoes are not included in the figures given in the table. The domestic shoe industry supplied nearly all domestic needs in 1939,

¹² *Foreign Crops and Markets*, Aug. 4, 1941, pp. 122-23.

¹³ A fire in the only vegetable-oil factory recently stopped industrial production of oil.

when only 6,000 pairs of shoes were imported. Imports of shoes in 1929 totaled 237,000 pairs, and in 1925 a peak of 611,000 pairs was recorded. Imported leather and shoe findings used in making shoes still reach a larger total than the value of domestic materials used by the industry.

B. Sources

The United States has been the chief supplier of Dominican imports. Wartime trade dislocations increased the United States' share from 53 per cent of total imports in 1938 to 59 per cent in 1939 and 66 per cent in 1940. In previous years the United States' share remained at about half, or slightly under half, of total imports. The United States supplies most of the imports of automobiles and motor trucks, chemical and pharmaceutical products, lard, confectionery, leather, paints, pipes, plumbing supplies, wire, machinery, tires and rubber goods, and a long list of minor products, mostly manufactured. In 1939 the United States supplied 37 per cent of the important cotton piece-goods group, with Japan supplying 56 per cent.

Japan for some years has been second in importance in the import trade, supplying between 10 and 13 per cent of imports in the five years ending in 1939. Japanese imports dropped to 8 per cent of the total in 1940. Cotton piece-goods are by far the most important items furnished by Japan, totaling in value \$929,000 in 1939, compared with a total of \$1,112,000 for all imports of Japanese merchandise in that year.

Germany, until 1940, was regularly third in importance in the import trade, supplying merchandise worth from \$600,000 to \$930,000 in each of the five years ending in 1939. Imports from Germany in 1939 consisted of cement (\$208,000), bottles (\$35,000), leather (\$14,000), kitchen utensils (\$20,000), nails (\$17,000), barbed and plain wire (\$48,000), beer (\$12,000), wrapping paper (\$40,000), and miscellaneous manufactured articles.

Most of the jute bags imported for use by the sugar industry and by the cacao and coffee trade are from British India. The imports from 1930 to 1939 are given on the following page.

	Amount (In thousands of kilograms)	Value (In thousands of dollars)
1930	4,775	781
1931	3,518	460
1932	4,258	432
1933	3,990	337
1934	3,525	368
1935	4,473	504
1936	5,940	642
1937	4,252	440
1938	5,151	510
1939	4,900	486

The import trade with Great Britain was valued at \$360,000 in 1939, and consisted chiefly of cotton piece-goods, cotton thread, and machinery. France supplied goods valued at \$347,000 in the same year, consisting chiefly of wines and liquors (\$30,000), olive oil (\$23,000), miscellaneous food specialties, perfume, and cosmetics (\$20,000), and miscellaneous chemical and pharmaceutical products (about \$76,000).

Refined petroleum products (gasoline, kerosene, and lubricating oils) are obtained chiefly from the United States, although important quantities of fuel oil and gasoline are supplied by the Netherlands West Indies. Of imports of petroleum products, totaling \$696,000 in 1939, imports valued at \$290,000 were from the Netherlands West Indies. Most of the balance was from the United States.

Silk and rayon goods, valued at \$112,000 in 1939, were obtained chiefly from the United States (49 per cent) and Japan (44 per cent). Salted codfish, one of the principal food imports, was supplied chiefly by the United States (45 per cent), France (34 per cent), and by the French islands of Miquelon and St. Pierre (17 per cent). Imports were valued at \$161,000 in 1939. Other fish imports were unimportant. Wheat flour imports, valued at \$193,000 in 1939, came chiefly (93 per cent) from the United States. Canada supplied most of the remainder.

The analysis emphasizes the fact that, of imports which might be replaced by the development of domestic sources of supply, only cotton goods, jute bags, cement, wheat, and fish are consumed in

quantities great enough to offer large-scale possibilities for local consumption. Other imported commodities are the products of manufacturing industries which could not be established in the Republic for technological reasons (for example, automobiles, machinery, paper, paints); or commodities which are consumed in such small amounts that the establishment of domestic industries would offer little or no opportunity for immigrant employment.

CHAPTER XIV

EMPLOYMENT, WAGES, AND NATIONAL INCOME

In this chapter we bring together the limited data available on the character and extent of the occupations pursued in the Dominican Republic; the levels of wages in agriculture, industrial activities, and government employment; and the national income and standards of living of the Dominican people. While the statistical information is far from adequate, it is nevertheless possible to give a rough picture of the situation.

I. OCCUPATIONAL DISTRIBUTION

The census of 1935 showed a total population of 1,479,417, of which 82 per cent was rural and 18 per cent urban. It is estimated that the total population in 1940 was 1,650,000. Of this total, assuming the same distribution as in 1935, the rural population would be 1,360,000 and the urban 290,000.

The rural population is not identical with farm population. Included in the first category are many families engaged in such activities as rural handicrafts, gold mining, lime and charcoal burning, fishing, lumbering, and rural trade and transportation services. We have no direct means of determining how many are engaged in these rural occupations other than farming; but in the light of information about the farm population proper we estimate that the rural nonfarm group numbers roughly 60,000, indicating a farm population of about 1,300,000 (79 per cent of the population). Persons listed in the census of 1940 as *working* on farms numbered 738,048. This figure includes 328,303 men, 165,260 women, and 244,485 children. Apparently only about half of the farm women are classed as farm workers. The average employment of children in farming is 1.1 per farm. The average size of family for the country as a whole is about 5.5 persons, and the average size of the farm families, based on United States experience, may be higher, or perhaps 6 per family. Since there are 218,000 farms, it would appear that the total population living on farms is something like

1,300,000. This would leave in the neighborhood of 60,000 (10,000 families) dependent upon miscellaneous rural occupations. Some thousands of the farm population probably engage in occupations other than farming, although they are members of farm families. Similarly, it seems evident that many who are included in the official urban classification obtain a good part of their income from farming. The population of the 7 largest cities totaled 166,464. Deducting the latter figure from the recorded total urban population indicates that there must be about 124,000 individuals who live in very small towns or crossroads settlements. Their environment is definitely rural, and it is evident that they engage to some extent in farming.

Employment in important nonagricultural occupations appears to be about as follows:

Manufacturing ¹	
Sugar ²	1,181
Other foods	3,055
Leather and manufactures	2,437
Forest products	1,069
Chemicals (chiefly soap, salt, and distilling)	244
Textile products	979
Stone, clay, and manufactures	104
Miscellaneous	2,165
Electric light and power ³	301
Physicians and surgeons ⁴	284
Government ⁵	10,400

II. WAGES

Agricultural. There is no strong seasonal movement of labor except in the sugar-cane industry. Recruited migratory workers from Haiti are employed in the labor-deficit areas. In most other agricultural industries the harvesting and heavy farm work are accomplished by the co-operative effort of neighboring farmers

¹ *Anuario Estadístico*, 1938, Vol. 2, p. 53.

² *Anuario Estadístico*, 1938, Vol. 2, p. 84. The sugar industry also employed 22,659 "laborers." Most of these are engaged as cane-cutters or in similar agricultural activities and hence are not included here.

³ *Anuario Estadístico*, 1938, Vol. 2, p. 137.

⁴ *Anuario Estadístico*, 1938, Vol. 1, pp. 443-49. Doctors in government employ not included.

⁵ These data are for 1941 and are compiled from *Law of Public Expenditures*, 1941.

working in *juntas* without wages. Work performed by laborers hired on a wage basis by the owners of large plantations, or hired by small farmers for special tasks, represents a small part of total farm work performed.

The 1940 farm census included a survey of wages paid to farm workers. A summary of the result, by provinces, is given in the

AVERAGE WAGES PAID TO FARM WORKERS, BY PROVINCES, 1940^a
(In cents per day)

Province	Without Board	With Board
Santo Domingo.....	40	25
Azua.....	37	27
Barahona.....	37	24
Benefactor.....	27	20
Duarte.....	27	22
Españat.....	28	23
La Vega.....	27	21
Libertador.....	30	20
Monseigneur de Nouel.....	32	27
Monte Cristi.....	31	24
Puerto Plata.....	28	23
Samaná.....	30	25
San Pedro de Macorís.....	37	27
Santiago.....	31	22
Seibo.....	38	31
Trujillo.....	33	23
All provinces.....	32	23

^a Compiled from preliminary data, farm census of 1940.

accompanying table. Wages are highest in the District of Santo Domingo, as is to be expected, and very low in a few districts where the farm population is high. The value placed on board for a farm laborer ranges, in 10 out of 15 provinces, from 5 to 9 cents a day.

Even the sugar industry is not a large employer of laborers receiving fixed daily wages, inasmuch as sugar-cane workers are paid on a piecework basis.

Daily earnings of cane workers average about the same as those for other farm laborers, although good workers are said sometimes to obtain as much as 60 cents per day. Negro workers from Haiti are generally considered better than native Dominicans at this type of work, and it is difficult to get Dominicans to cut sugar cane.

The absence of a large floating population of Dominican migratory workers is a factor for social strength. Agricultural production cannot be fully efficient, however, without an adequate supply of seasonal labor, systematic recruiting, and proper labor distribution. The present low returns per acre can be improved by more studied

SALARIES AND WAGES OF PUBLIC EMPLOYEES AND WORKERS, BY OCCUPATIONS^a
(In dollars per month)

Occupation	Salary	Occupation	Salary
MANUFACTURING			
Carpenters and cabinet-makers..	50-60	CLERICAL— <i>cont.</i>	
Carpenters' assistants.....	15-45	Stenographers.....	70-150
Seamstresses.....	8-20	Typists.....	40- 60
Electricians.....	60-75	Bookkeepers and accountants..	90-150
Firemen (tugboat).....	30-35	File clerks.....	50-125
Oilers for machinery.....	35-40	Messengers.....	10- 30
Mechanics.....	60-80	Interpreters.....	75-
Plumbers.....	60-	Business machine operators.....	70-125
Pressmen.....	50-	Cashiers.....	125-
Shoemakers (instructors).....	50-	Court secretaries.....	50-120
Tailors (instructors).....	50-	PROFESSIONAL	
TRANSPORTATION AND PUBLIC WORKS		Judges.....	200-350
Seamen.....	16-30	Judges of instruction.....	125-175
Chauffeurs and truck drivers.....	25-45	Lawyers.....	75-150
Mail carriers.....	15-30	Physicians.....	100-150
Telephone operators.....	40-50	Engineers (architecture).....	175-
Foremen (road construction).....	70-	" (construction).....	175-
Foremen (sewer construction).....	60-	" (industrial chem- istry).....	125-
Overseers.....	40-70	Engineers (agriculture).....	125-
Overseers' assistants.....	40-	Agronomists.....	125-150
Warehousemen.....	45-60	Biologists and geneticists.....	100-125
DOMESTIC		Surveyors.....	150-170
Cooks.....	8-15	Forest rangers.....	35-
Laundresses.....	8-15	Forestry experts.....	-100
Servants.....	5- 8	Teachers.....	36- 50
Janitors.....	15-30	School principals.....	60- 90
Night watchmen.....	25-40	Librarians.....	40-
Gardeners.....	10-25	Draftsmen.....	60-140
CLERICAL		Pharmacists.....	60-
Secretaries.....	75-100	Nurses.....	15- 25
		Barbers.....	10- 20

^a Omitting extremes of no apparent significance. Compiled from government budget for 1941.

land utilization, greater utilization of water resources, and changes in agricultural practices. Given these, however, availability and organization of labor are still necessary to obtain the maximum income per acre, per man, and per month. The supply of Haitian labor, if he kept under proper control, can be an important asset.

Government. Salaries and wages paid to government workers are

sufficiently representative to give some indication of the general wage level in private employment, although the government wage level is possibly somewhat higher. A list of selected occupations

NUMBER EMPLOYED AND AVERAGE ANNUAL EARNINGS OF WORKERS IN IMPORTANT MANUFACTURING INDUSTRIES AND TRADES, 1938^a

Industry	Number Employed	Average Yearly Earnings
Food		
Sugar.....	23,840	\$195
Bakeries.....	636	160
Rice hulling.....	492	105
Coffee hulling.....	434	83
Tapioca starch.....	210	128
Distilleries.....	162	347
Cheese factories.....	104	107
Alimentary paste.....	85	200
Brewing.....	66	535
Butter and margarine.....	39	197
Edible oils.....	32	358
Textile products		
Tailors.....	470	112
Shirts and underwear.....	420	102
Mattresses and pillows.....	39	142
Forest products		
Sawmills.....	468	134
Cabinetmakers.....	223	188
Leather and its manufactures		
Shoemakers.....	2,273	63
Tanneries.....	106	212
Stone and clay products		
Floor tiles and cement blocks.....	62	280
Miscellaneous		
Cigar factories.....	1,140	96
Machine shops.....	346	233
Printing.....	288	377
Matches.....	152	161
Soap.....	106	241
Cigarettes.....	72	302
Laundering.....	62	129
Lithographing.....	41	695

^a Compiled from *Anuario Estadístico*, 1938, Vol. 2, pp. 73-148. Owing to a lack of data, the industry totals for number employed will not agree with the figures in the table on p. 223.

and corresponding yearly salaries, taken from the government budget, is given in the table on page 225.

Manufacturing and miscellaneous. The wage level of employees in Dominican manufacturing and miscellaneous industries is indicated in two tables. The table on page 227 shows the daily wage rates in selected occupations, as obtained directly from managers of

DAILY WAGE RATES IN SELECTED OCCUPATIONS^a

Industry and Class of Labor	Sex	Daily Hours ^b	Daily Wage
Bottling, beer and soft drinks			
Common labor.....	Girls	9	40 cents
Skilled labor.....	Men	9	65 cents
Bottling, other ^c			
Common labor.....	Boys	8	30 cents
Common labor.....	Women	8	50 cents
Semiskilled labor.....	Men	8	60 cents ^d
Foreman.....	Men	8	\$1.50
Brewing			
Skilled labor.....	Men	9	\$1.00
Assistant brewmaster.....	Men	9	\$2.00-\$2.50
Foreman.....	Men	9	\$2.00
Building trades, common labor.....	Men	9	50-60 cents ^d
Carpenter, skilled (master).....	Men	9	\$1.50-\$2.00
Charcoal, common labor ^e	Men	...	10-20 cents
Chocolate and candy			
Common labor.....	Girls	8	30 cents
Common labor.....	Women	8	50 cents ^d
Specialist.....	Men	8	\$1.00
Cigar, skilled ^f	Men	8	\$1.00
Cigarette, skilled machine operator ^f ..	Men	9	\$1.00
Electric			
Common labor ^g	Men	8	50 cents
Common labor.....	Men	8	60 cents
Semiskilled labor.....	Men	8	80 cents
Skilled machine operator.....	Men	9	\$1.50-\$2.00
Leather, common labor.....	Men	8	60-70 cents
Mason, bricklayer, skilled.....	Men	9	\$1.00-\$1.50
Match, ^h			
Common labor.....	Men	8	50 cents
Specialist.....	Men	8	\$1.00-\$1.50
Nail, skilled.....	Men	8	\$1.00
Seamstress			
Shirts, semiskilled.....	Women	8	60 cents
Shirts, skilled.....	Women	8	90 cents
Shoe			
Unskilled.....	Women	8	60 cents
Skilled.....	Men	8	\$1.00
Foreman.....	Men	8	\$1.50-\$2.00
Skilled machine operator.....	Men	8	\$2.00-\$3.00
Soap			
Common labor.....	Girls	8	45 cents
Skilled labor.....	Men	8	75 cents
Starch ^g			
Common labor.....	Girls	8	40-50 cents
Foreman.....	Men	8	\$1.50
Tanning, foreman.....	Men	9	\$1.50-\$2.00

^a Compiled from data obtained directly from establishments representing all important nonagricultural industries. All establishments located in Ciudad Trujillo with the exceptions indicated by footnotes *e* and *f*.

^b The normal work week varies from 48 to 54 hours, with a legal maximum of 58 hours.

^c Rum, wines, and liquors, bay rum, perfumery, cosmetics, and pharmaceuticals.

^d Maximum.

^e Province.

^f Urban.

industrial enterprises, and the table on page 226 shows the average yearly earnings of workers, compiled from the *Anuario Estadístico*. In connection with the latter table, a reservation must be made, since the average earnings in many cases do not represent earnings of persons employed throughout the year. Average earnings of sugar-industry employees, for example, cover only the milling-season, or approximately 5 months. During the balance of the year, many of the cane workers may be employed in other occupations. Employees in industries such as brewing and printing, however, ordinarily obtain full-time employment, and the figures given represent more accurately true average earnings. Salaries of executives also may distort the results in cases where executive salaries are a high proportion of the total pay roll. The manifestly distorted figure in the case of the shoe industry (earnings of only \$63 per year) is perhaps attributable to a high labor turnover, or to inaccurate reporting. In general, however, the table gives a good idea of the average earnings of industrial workers, and of the relative importance of various industries as employers of labor.

The table throws into relief the relative importance of the sugar industry as an employer of labor. It should be emphasized, however, that all but about 1,200 workers in the sugar group are engaged in the agricultural branch of the sugar industry, whereas the other groups cover industries engaged chiefly in manufacturing.

III. NATIONAL INCOME AND LIVING STANDARDS

National income may be measured by the value of the aggregate production in the various divisions of economic activity. This is because income is generated by production; and wages, interest, dividends, rents, etc., are paid out of the money received from the sales of products.⁶ The national income data are presented in summary form in the text, the discussion of the methodology and the degree of reliability of the estimates being relegated to a supplement at the end of this chapter.

⁶ "From the national standpoint, production and income are what may be called simultaneous equivalents. Production generates income and measured in terms of money, the two are exactly equal." Maurice Leven, Harold G. Moulton, and Clark Warburton, *America's Capacity to Consume* (1934), p. 137.

National income in 1940. The national income produced in 1940, according to our estimates, amounted to about 70 million dollars, not taking into account the net outflow of interest and dividends on foreign investments, estimated at roughly \$1,500,000 in 1940.⁷ The income total is at best such a rough approximation, however, that allowing for a possible wide margin of error, we might more safely place it somewhere between 60 and 80 million. The table below shows estimates for the various classifications of activity.

NATIONAL INCOME PRODUCED, BY INDUSTRIES, 1940

Industry	Income (Millions of dollars)	Percentage Distribution
Agriculture.....	41.4	58.9
Manufacturing.....	7.8	11.1
Government.....	7.0	9.9
Trade and service.....	9.0	12.8
Transportation and communication.....	1.5	2.1
Electric light and power.....	.5	0.7
Construction.....	.8	1.1
Forestry, fisheries, and mining.....	.9	1.3
Finance.....	1.5	2.1
Total.....	70.4	100.0
Less:		
Interest and dividends (net outflow) ..	1.5	
Income produced (net).....	68.9	

Per capita and family incomes. The per capita income of the Dominican people, on the basis of an aggregate income of 70 million dollars, amounts to about \$42. Since the average Dominican family, according to census data, numbers 5.5, the average family income amounts to about \$230 per annum. Much of this is not cash income, because the calculation takes into account non-cash income received in the form of goods produced and consumed on farms. Of total farm income, estimated at 41 million dollars, it seems probable that not more than 18 million dollars (and very likely less) represents cash.

With 1,300,000 persons living on farms, the per capita farm income must be in the neighborhood of \$32. The income of the

⁷ This estimate differs somewhat from that given on p. 320 because it includes trade and service income and government disbursements. Moreover, it relates to the year 1940, whereas that on p. 320 relates to 1939.

typical Dominican farm family, therefore, probably falls in the \$150 to \$250 range.⁸ With a total income of around \$200, a family receives perhaps as much as \$80 in cash from such crops as coffee and cacao, plantains, rice, corn, and beans.⁹ The balance (\$110 to \$120) is the imputed value assigned to the farmer's food crops and other agricultural commodities produced and consumed on the farm.

The urban and rural nonfarm population, totaling about 350,000, accounts for the remainder of the national income, amounting to 29 million dollars. The per capita income of the nonfarm group, on this basis, amounts to \$83. Hence the income of the typical nonfarm family probably falls in the \$300 to \$500 range, although there are, of course, wide extremes, with many nonfarm workers receiving in wages no more than the farmer receives in cash and in kind.

Standards of living. Per capita income figures cannot be taken without qualification as a fair measure of the varying levels of living in different areas. For example, a per capita income of \$300 in the Appalachian area has a very different meaning from the same income in the vicinity of Chicago. A rough indication of the standards of living of the Dominican population may, however, be given by comparison of estimated family expenditures there with those for the lowest income groups in the United States.

For this comparison we have selected agricultural families in the state of South Carolina, where conditions come closest to those existing in the Dominican Republic. In South Carolina the climate is comparatively mild. Living costs are generally cheaper than in other parts of the United States. The percentage of negro population is high (45.6 per cent in 1930). Productivity is generally low, and there has been relatively little industrial development. The urban population is relatively small. The per capita income of the farm population of South Carolina for 1929 has been estimated

⁸ Since farm families generally are larger than city families, we assume that there are about 6 to the farm family, indicating an average farm-family income of about \$190.

⁹ Cash income includes wages paid to hired labor, particularly some 4 million dollars paid to 20,000 sugar-cane cutters. If we adjust for these earnings, much of which is received by migratory workers and by individuals who are not members of farm families, cash income per farm family drops to about \$65.

at \$126 or about \$630 per family,¹⁰ a figure lower than that for any other state.

The income of the average Dominican farm family in 1940 has been fixed by the present study in the \$150 to \$250 range, or say, for present purposes, about \$200. The spread between the income figures for the United States and the corresponding figures for the Dominican Republic is large; but if compensating factors are taken into account it appears that the disparity in income is much less than the figures seem to indicate.

In the first place, the typical Dominican family expends less for food than does the low-income American family. Despite relatively high prices for some foods, such as rice, sugar, and meats, the general level of food prices in the Dominican Republic is well under that in the United States. The lower price level is reflected in the Dominican figures for income in kind as well as in cash. It seems probable that the typical Dominican farm family spends roughly \$150 for food—chiefly the value of food grown on the farm—leaving about \$50 in cash income to be spent for other purposes.

Second, the cost of shelter for the Dominican farmer is very much less than that of the American low-income farmer, who must have a reasonably weather-tight house and some fuel, even in the southern states. The Dominican farmer obtains adequate shelter at almost no cost other than his own labor. Probably \$5 per year would cover his outlay for shelter. The American low-income farmer in Kentucky and Virginia, according to a study made in 1930, spends \$105 for housing.¹¹

Third, the expenditure for clothing in the Dominican Republic is negligible. The average Dominican family (farm and nonfarm) spends about \$15 a year for clothing. This compares with roughly \$100 per comparable family in the United States.¹² Making allowances for climatic conditions, the Dominican farm family is perhaps as adequately clothed as is the American farm family living on a subsistence basis.

There is one important factor not reflected in the figures which

¹⁰ Leven, Moulton, and Warburton, *America's Capacity to Consume*, p. 173.

¹¹ The same, p. 251.

¹² The same,

is to the disadvantage of the Dominican farm family. The American farmer is the beneficiary of many kinds of free services which have no counterpart in the Dominican Republic. He receives effective assistance from the federal and state governments in technical matters relating to agriculture; and there are private organizations which render similar services at little or no cost. His social life is brighter because of the work of church organizations and recreational and social agencies. His children can receive a good education in free public schools. The Dominican farmer, except in smaller degree in connection with church and educational benefits, receives very little in the way of free goods and services.

We have shown that nonfarm families (numbering about 350,000 individuals) appear to have an income ranging from \$300 to \$500 per family. Of this amount, the family spends perhaps \$200 for food and the balance for housing, clothing, and miscellaneous purposes. In contrast, the families of American wage earners in the lowest income groups appear to expend something like \$370 for food.¹³

¹³ The same, p. 247.

NOTE ON METHODOLOGY

The general method used in deriving these estimates has been to deduct certain costs from gross income. In some cases, income estimates have been based on wage data. Rough guesses have been made where official or reliable data are fragmentary or entirely lacking.¹

For agriculture, the estimate for gross income was based on Dominican government statistics. The cost deductions consisted chiefly of recorded imports of implements, fertilizer, and other materials, plus taxes. Direct taxes on agriculture are from official sources.² A rough approximation was made for domestic materials used, which are relatively unimportant, and for repairs to property, fencing, purchase of livestock, interest, depreciation, and miscellaneous costs. These items are not large because agriculture in general is close to a subsistence basis.

Dominican statistics for manufacturing are quite complete, and are believed to be more accurate than those for other major industries. The official figures for gross value of goods were raised slightly to cover probable omissions. Cost deductions, including direct taxes on manufacturing, were adjusted to include depreciation, which was approximated at 5 per cent of capital assets. The gross value of handicraft production was estimated by applying average prices to census reports of the volume of handicraft goods produced. A rough guess for cost deductions was based in part on the results shown by manufacturing and in part on general observation.

Income produced by government was determined by deducting purchases of supplies, equipment, and similar expenses from total budget allocations. The small item for pensions, as well as teachers' salaries, day-labor pay rolls, and interest payments is thus included. Charity income is negligible. Budget statistics for the national government were used because data for actual disbursements are not published. For municipalities—a relatively unimportant item—expenditures are recorded but wage data are not given separately. These expenditures included interest, and various disbursements such as public works, which were regarded as consisting largely of pay rolls.

The important field of trade was found difficult to handle satisfactorily, since there are no statistics for pay rolls, number employed, or average wages. A rough figure for trade income was derived largely by applying estimated incomes of different classes of merchants to the corresponding recorded numbers of trade establishments, taking into consideration differences in the social status of the various groups and the

¹ Owing to the insufficiency of data for wages (except manufacturing), dividends, and interest, estimates for income paid out could not be made.

² Of total tax receipts a residual of 1.4 million dollars was allocated to agriculture, since this industry contributes the major share of indirect taxes.

probable number earning a livelihood from trade. Most of the 10,000-odd retail stores are obviously one-family establishments. Six thousand of these stores are in rural areas. The number of hired employees presumably is small.

Income produced by the service industries was determined by applying data for average wages to estimates of the numbers employed. The number of individuals employed in eating places, repair service, personal service, and amusements was estimated from data for the number of licensed establishments. The average wage estimate used was based on government figures for representative establishments. Government data give the number of professional and business agencies of various kinds. The probable average earnings of these groups were estimated from pay rolls of professionals in government employ. A rough guess for the services of domestics, amounting to \$600,000, is probably high.

In the field of transportation and communication fairly complete statistics are available for railroads and for telegraph, telephone, and postal services. Income from shipping and the coastwise trade was approximated from the number of vessels in service and the volume of freight carried. Census data give the number of pack animals. From data for motor truck and taxi registrations it was possible to estimate the capital invested in motor transportation and probable maintenance and depreciation costs. Gasoline imports gave an indication of fuel consumption, and license and toll receipts provided another indication of the volume of business and probable numbers employed.

Other industrial groups are relatively unimportant. Reliable and complete data are available for the electric light and power industry. Official data, adequate for present purposes, give the value of building construction, the cost of materials used, and taxes. A rough estimate for income from fisheries was based on government reports of the fish catch. The small income from mining and forestry was estimated from official data for gold exports and for sales of forest products to domestic manufacturing industries. In the field of finance the income from banking was estimated from a government analysis of the cost of banking operations. Adequate data are available for insurance operations. Real estate and mortgage transactions were roughly gauged from the government census of buildings and from government reports of annual mortgage transactions.

No attempt has been made to estimate the income from other miscellaneous sources. These would include earnings from illegal pursuits, odd-job employment, changes in the value of assets, services of housewives and other members of the family, and services of owned durable goods. Compensation payments for injuries would be very small.

We will here consider the major factors influencing the reliability of the results. Although these estimates are but rough approximations and

subject to an upward bias, some confidence may be placed in the relative magnitude of the various classifications. For the most important items official records give a considerable volume of data. With the improvement in government statistical methods and reporting during the past several years, these data are reasonably reliable for our purposes. The statistical coverage is especially complete for the important fields of agriculture, manufacturing, and government. Also, the relative simplicity of the Dominican economy minimizes some of the problems in estimating national income.

There are shortcomings in the methodology and data deficiencies which seriously affect the reliability of the final results. The total charge for consumption of capital equipment used in production is a rough guess. A heavier charge for depreciation of farm land and farm equipment probably should be made, reducing the final farm income total. A considerable number of individual items are based largely on conjecture. In the aggregate these amount to about 15 per cent of the total figure. The estimates for some productive activities may well have a monetary value greater than the allowance made in the estimates. These would include rural handicrafts, transportation by pack animals, unrecorded credit transactions, rural construction, the use of farm labor through exchange of services (*juntas*), and services performed by rural markets and by barter transactions. Owing to difficulties in arriving at reliable figures for agricultural production, inconsistencies of major importance are believed to remain in these data. No adjustment has been attempted in cases of duplication such as exist in postal and telegraph services and part of the public construction activities.

An appraisal of the reliability of these estimates gives the following result:

	Per Cent
Fully reliable	14
Good estimate	11
Fair approximation	60
Informed guess	15
Total	100

The important agricultural classification, accounting for 59 per cent of the total national income, has been considered as only a "fair approximation." The trade and service item—13 per cent of national income—is regarded as only an "informed guess." Mining, railroads, telegraph, and postal services, insurance transactions, and national government income are based on "fully reliable" data, and the results are believed to include all income. Adjustments for duplications would give slightly lower net figures. The figure for manufacturing industries has been classed as a "good estimate."

CHAPTER XV

CURRENCY, BANKING, AND CREDIT

Until October 1941, the Dominican Republic had banking facilities rather than a banking system. These facilities consisted of three foreign-owned and -operated branches of strong parent institutions with head offices located in the United States and Canada. The first and largest was the branch and sub-branches of The National City Bank; the second a branch of the Royal Bank of Canada; and the third a branch of the Bank of Nova Scotia. Combined deposits in recent years averaged about 8 million dollars.

Except as The National City Bank served as depository and fiscal agent of the government, all three were operated exclusively and typically as commercial branch banks. Though they habitually carried a cash reserve of around 20 per cent of deposits within the country, their major reservoir of both cash and credit was located abroad. Except for bank premises and fixtures, they had no independent capital structure. In every sense they were essentially a part of the banking systems of Canada and the United States and represented an extension of the facilities of these systems rather than an independent Dominican system.

Purchase in 1941 by the Dominican government of the local branch of The National City Bank and its metamorphosis into the Reserve Bank of the Republic (Banco de Reservas de la Republica Dominicana) may conceivably mark the inception of a national banking system. Just how the Reserve Bank will function in its new capacity is not yet clear. For some time there has been a pronounced desire for credit facilities other than those supplied by the commercial banks, notably for agricultural credit. A pending constitutional amendment would authorize the issue of Dominican paper currency. With the new Reserve Bank there is a possibility that banking may be decreed a monopoly reserved to Dominican nationals. Any of these measures would constitute an important structural change in the banking position, requiring the organization in some form of a national banking system.

Except to note the possibility of change, this survey cannot deal with potentialities. Fairly complete and comprehensive bank figures for the years 1937-40 are available,¹ and discussion of the banking situation will be based on these data. The following brief description of the currency situation is also based on data for the period prior to 1941.

I. CURRENCY

The currency of the Dominican Republic, except for subsidiary coinage, consists of United States notes, mainly the small denomination \$1, \$5, and \$10 bills. Few bills of larger denomination circulate outside the banks, and, even in the latter, few \$100 notes are obtainable. The major demand is for the \$1 bills.

There are no exact data on the amount of currency in circulation. Cash in banks is reported, as is the import and export of currency by the banks. However, no estimate or census of currency in general circulation was ever made against which to apply this recorded movement. The best estimates obtainable place the total volume of currency and coin at from \$4,000,000 to \$4,500,000, of which an average of around \$1,500,000 is usually in the banks.² This leaves about \$2,500,000 to \$3,000,000 in general circulation. Thus the total per capita supply of currency and subsidiary coins in the Republic is roughly \$2.50 to \$2.75. Of this, \$1.00 per capita is in the banks, leaving only about \$1.50 to \$1.75 per capita to satisfy general circulation requirements.

Subsidiary coins are similar in size, composition, and denomination to United States coins but are a distinctive issue of the Dominican government. There is no United States coinage in circulation, nor is it legal tender. The subsidiary issue totals \$720,000.³ As these

¹ Consolidated monthly figures as reported by the banks to the National Statistical Office. Changes in the form of reporting make it difficult to employ more recent figures.

² Data furnished by the managing directors of the three banks.

\$1.00, silver,	15,000	pieces,	coin value \$	15,000
50 cents, "	500,000	"	"	250,000
25 cents, "	720,000	"	"	180,000
10 cents, "	1,150,000	"	"	115,000
5 cents, nickel,	2,200,000	"	"	110,000
1 cent, copper,	5,000,000	"	"	50,000

Totals	<u>9,585,000</u>		<u>\$720,000</u>
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coins are freely convertible into United States notes within the Republic, parity of the Dominican coinage is fully maintained, and the foreign exchange rate of the currency as a whole is that of the United States dollar. All money figures quoted are, therefore, United States dollars, actual or equivalent, unless otherwise stated.

II. CHARACTER OF BANKING OPERATIONS

The three banks which have constituted the total banking facilities of the Republic are commercial banks. These banks receive and administer demand, savings, and time deposits; make such loans as fall within the province of commercial banking; and render the usual services. They are in general thoroughly typical of institutions of the kind doing business in tropical agricultural countries, and the Caribbean islands in particular. As the trade of this area revolves primarily around the export of agricultural produce and the import of industrial goods, a prime function of banking is the financing of trade. The banks fulfill this function by making advances against the movement of crops, purchase and sale of foreign exchange, issue of bills of exchange and letters of credit, handling of commercial paper, and making of secured loans to the merchant, trader, and producer. In addition, these banks act as correspondents for foreign banks, and receive and remit cash abroad. In short, they do what is usually termed a general banking business.

The table on page 239 shows the consolidated bank position by major items during the years 1937-40 for the three banks doing business in the Dominican Republic. Average deposits are \$8,079,000, average loans \$3,885,000, and bank cash \$1,584,000. The deposits average about \$5.20 per capita, loans \$2.50, and bank cash \$1.00. These amounts are not impressive either in total or on a per capita basis.

Foreign balances of the three banks can be roughly computed from these figures. Balances held abroad have averaged about \$2,610,000 over the four years under review. The ratio of loans to deposits therefore works out at 48 per cent, bank cash to deposits 20 per cent, and foreign balances to deposits 32 per cent. In cash or equivalent the banks during this period were at least 50 per cent liquid.

DEPOSIT, LOAN, AND CASH POSITION OF DOMINICAN BANKS, 1937-40
(Average of month-end figures, in thousands of dollars)

Year	Deposits ^a	Loans ^b	Cash ^c	Computed Balances with Foreign Banks ^d
1937	7,499	3,647	1,432	2,420
1938	7,785	3,726	1,497	2,562
1939	8,662	4,006	1,617	3,039
1940	8,368	4,159	1,788	2,421
Four years	8,079	3,885	1,584	2,610
<i>Percentage ratio of loans and cash to deposits .</i>	<i>100</i>	<i>48</i>	<i>20</i>	<i>32</i>
Per capita average ^e	\$5 20	\$2.50	\$1.00	\$1 70

^a Combined demand, savings, time, and government deposits.

^b Total of all categories of loans.

^c Includes balances due from other local banks.

^d Computed by subtracting loan and cash assets from deposit liabilities. These amounts very largely represent balances of Dominican branch banks with their respective head offices in the United States and Canada.

^e Figured on an approximate average of 1,550,000 people.

Deposits. Bank deposits provide some indication of the economic strength of a country and the wealth of its people. By and large, commercial bank deposits represent the day-to-day working capital of a nation, and some part of its cash savings where savings accounts are included. Banks originated as institutions for the safe-keeping of treasure and still retain that prime characteristic. Some peoples are more accustomed than others to the use of this facility, but in any money economy, even the most backward, there is a limit to the amount of cash that can be stowed away in the sock, secreted in the mattress, or hidden under the hearth. With the advent of the more readily destructible paper money, the risks of such hoarding increased. Although recent introduction of the minimum balance and service charge tend to curtail small-account banking and increase currency circulation, the great bulk of current working capital and a very considerable part of the small cash savings everywhere are now reflected in the banking figures.

Total bank deposits in the Dominican Republic during 1937-40 ranged from \$7,000,000 to almost \$9,800,000, with an annual average for the period of just under \$8,100,000. This is a fair index of the low economic state of the country and people. Of the total

deposits of 1940, which averaged \$8,368,000, some \$5,373,000, or 64 per cent, were demand deposits. Of the latter, \$1,080,000 belonged to the government and municipalities, and \$4,293,000 to private individuals, partnerships, and corporations. The balance, amounting to \$2,996,000, was made up of savings and time deposits.⁴ With an average during 1940 of almost \$3,000,000 immobilized in savings accounts, with government deposits averaging almost \$1,100,000, and with some \$2,400,000 of the total deposits held abroad in the form of foreign balances of the Dominican banks, domestic business and individuals within the country—as distinct from the import and export trade—were apparently able to get along on only about \$1,870,000 of bank money,⁵ or an amount about equal to cash in banks at the end of 1940. This, for a country of more than 1.5 million people, is a much smaller volume of bank money than many rural communities of less than 5,000 population have in the United States.

Total deposits, averaging just over \$5.00 per capita in 1940, are made up of demand deposits, including those of the government, of around \$3.25 per capita, and savings accounts of about \$1.80 per capita. This compares with total per capita deposits in North Dakota of about \$154.⁶

Turnover of deposits. Of itself, a small volume of deposits is not, however, conclusive evidence of national poverty. A small amount of bank money turning over rapidly can perform as much work as a large amount which turns over slowly. The measure of turnover is the combined monthly debit against deposits. The best index is the debit against demand deposits, but in the absence of segregated figures, the total charge against total deposits will serve the purpose. The inclusion of savings and time accounts will naturally tend to slow the velocity somewhat, but we are dealing only with commercial banks, and in the Caribbean area such deposits have a more rapid turnover than is customary in mainland institutions.

⁴ Time deposits are negligible, averaging only \$19,000 for 1940.

⁵ Demand deposits other than government averaging \$4,293,000 less the \$2,421,000 held abroad by the banks gives the same result.

⁶ Per capita and time deposits \$109.22, savings \$44.53; total per capita \$153.77 as of June 29, 1940. *Seventy-Eighth Annual Report of the Comptroller of the Currency*, 1940, p. 264.

The following table shows the average monthly debits and average monthly amount on deposit in the three banks doing business within the Dominican Republic.⁷ The deposit figures, representing the monthly average of deposits, should not be confused with the average amount on deposit at the end of each month quoted in the table on page 239.⁸

TURNOVER OF BANK DEPOSITS, 1938-40

Year	Bank Debits (Monthly average) ^a	Amount on Deposit (Monthly average)	Turnover of Deposits
1938.....	\$11,078,585	\$7,618,393	1.45
1939.....	11,683,758	8,688,497	1.34
1940.....	11,537,507	8,948,267	1.29
Three years	11,434,000	8,418,000	1.36

^a Includes both current and savings accounts.

For the three years 1938 to 1940 inclusive, debits have averaged \$11,434,000 per month on deposits averaging \$8,418,000. On average, therefore, deposits have turned over about 1.33 times per month, and 16.66 times per year. This indicates a total annual use of bank money⁹ of some \$137,000,000.¹⁰ Although the velocity declined from 1.45 times in 1938 to 1.29 in 1940, the total use of bank money was \$4,500,000 greater¹¹ in the latter year, owing to increase in the volume of deposits or, more directly, because of increases in the volume of debits.

The debit against demand deposits only is not available, but assuming that debits apply almost wholly against the demand deposits, the average monthly turnover in 1940 would be twice, as compared with 1.3 times for the total deposit.¹² A much higher velocity could be obtained by deducting also deposits held abroad, but this would involve assumptions that cannot safely be made.

By and large, the debit, and slow deposit turnover, confirm the

⁷ Compiled by the banks especially for this survey.

⁸ Three-year average of amounts on deposit at the end of each month is \$8,272,000, compared with a monthly average of \$8,418,000.

⁹ Payments by check, draft, or other charges on bank accounts.

¹⁰ Overstated by inter-account transfers, savings to current account, or vice versa.

¹¹ About \$138,500,000 in 1940 against \$134,000,000 in 1938.

¹² Average monthly debits in 1940, \$11,537,507 and average demand deposits about \$5,400,000.

conclusion of general economic debility. An average per capita use of only \$83 of bank money per year is direct evidence of a low state of economic activity, and especially so where the volume of other money¹³ is small and its estimated turnover relatively slow.

Loans. Total loans of all descriptions of the three Dominican banks over the four years under review averaged about 48 per cent of deposits. In monthly reports to the government, loans are classified as (1) real estate loans, (2) loans on current accounts, (3) loans on other security, (4) short-term loans, and (5) other loans. During 1940 the monthly average of all loans was as follows:

	Average Amount of Loans	Loans as Percentage of Deposits
Real estate	\$2,444,000	29.2
Current accounts	199,000	2.4
Other security	619,000	7.4
Short-term	532,000	6.4
Other	364,000	1.3
All loans	<u>\$4,158,000</u>	<u>49.7</u>

For purposes of general discussion the five classifications above will be reduced to two categories: (1) mortgage loans, and (2) all other loans.

Mortgage loans constitute about 60 per cent of total outstanding bank credit in the Dominican Republic. However, it should be noted that this is not a matter of bank policy, but rather the result of attempts to salvage a certain amount of credit which has encountered difficulty in the past. In other words, certain "other" loans have been reluctantly converted into mortgage loans in order to provide more security, and in an effort to recover the original advance. Owing to the vagueness of many land titles and the difficulty of foreclosure, mortgage loans, though fairly common, are by no means an attractive form of investment for the Dominican banks.

There are no figures for total mortgage debt of the Republic. In 1937, mortgages cancelled exceeded those granted by \$409,000, but in 1938 and 1939 new mortgages exceeded cancellations by \$226,000 and \$53,000 respectively.¹⁴ Many mortgages are un-

¹³ Currency in circulation outside the banks.

¹⁴ *Anuario Estadístico*, 1937, 1938, and 1939.

doubtedly held by both individuals and tradesmen, but so far as the banks are concerned, these loans, while large in relation to total loans, are small in volume considering the fact that much of the capital city has been practically rebuilt since the hurricane of 1930. They are likewise small in relation to the amount of urban residential building still in progress. The conclusion is that much of this building is out of individual savings, both because the banks are reluctant to lend on mortgages, and because real property for personal use or rent represents the safest and about the only form of Dominican investment for the individual. In 1940 mortgage loans of the banks declined from \$2,627,000 at the beginning of the year to \$2,380,000 at the end of December, a reduction of about a quarter of a million dollars in this category.

Outstanding bank credit other than mortgage loans ranges between \$1,500,000 and \$2,000,000. During 1940 it averaged about \$1,715,000 but at the end of the year was down to \$1,467,000. Representing as it does mainly commercial and enterprise credit, the amount is remarkably small for a country of over 1.5 million people with an annual bank money turnover of around \$135,000,000, even when the low state of business activity and the general high credit risk of the area are taken into account.

Interest rates. Rates charged by the banks average between 8 and 12 per cent annually with general charges for service higher than is customary in the United States. Few bank loans carry less than 8 per cent per year and non-banking interest rates range up to 5 per cent per month.¹⁵ Even in this area the latter are clearly usurious, and to a certain extent the former, though legal, must tend to curtail the use of bank credit. In all fairness to the banks, however, their position must be stated. Their claim is that high interest is not alone a reflection of the risk element involved in loans made, but is also due to the paucity of acceptable applications for credit and consequent need for high rates in order to cover

¹⁵ Annual interest charges average about as follows: mortgage loans, 8-12 per cent; approved overdrafts, 10; approved security, 10; short-term loans, 8 to 12; and other loans (up to 90 days) 8-12. Non-banking rates, or loans by individuals and private agencies, 18-24 per cent per annum and up to 5 per cent per month. Interest allowed on savings and time deposits: from \$5.00 to \$5,000, 1½ per cent; from \$5,000 to \$15,000, ½ per cent.

operating expenses and a reasonable banking profit on the small amount of business obtainable.

Whether or not the foregoing claim is valid, the fact remains that there are few business or industrial operations and no agricultural enterprise that can support an 8-12 per cent interest charge over any period of time. Except under boom conditions, which always create their own risk, the rate is prohibitive for real estate, and any mortgage loans carrying such a rate invite default. The American-owned sugar companies and other corporations with access to credit in New York or London pay no such interest charge because even they could not earn it on any volume of borrowed money.¹⁶ There are remarkably few forms of endeavor of any kind that can support an interest rate which doubles the capital sum in 10 years or less. It is no exaggeration to say that rates of this magnitude add appreciably to the normal risk for both borrower and lender. Certainly any such rate structure as is now prevalent in the Dominican Republic would kill refugee enterprise before it could get started. And rates charged are in strange contrast to interest allowed.

III. OPERATIONS AND CHANGES IN THE BANKING POSITION

Particular operations and changes have been commented upon in the foregoing brief discussion on currency, deposits, loans, and the velocity of turnover of bank money. The purpose here is to bring related operations and changes together in order to assess and appraise such significant movements as took place in the banking position from the beginning of 1937 to the end of 1940. With one possible exception these changes are not causal but primarily tend to reflect fluctuations in the Dominican economy itself. Though central banking operations are designed specifically to affect the credit, monetary, and economic activity of a nation, commercial banks alone, especially branch banks operating in an isolated area, exert no such influence. The Dominican bank operations must, therefore, be regarded as reflecting economic change rather than constituting a cause of such change.

The table on page 245 shows the principal bank items relating

¹⁶ As a rule, such corporations carry only working balances in the local banks.

to foreign operations, such as the purchase and sale of foreign drafts and bills of exchange, collections received and remitted abroad, commercial credits opened for foreign and domestic accounts, and the movement of currency. The figures call for little comment. It seems clear that the banks are functioning effectively in the financing and financial servicing of Dominican foreign trade.

PRINCIPAL FOREIGN OPERATIONS OF THE DOMINICAN BANKS, 1937-40^a
(In thousands of dollars)

Operations	1937	1938	1939	1940 ^b
Foreign drafts and bills of exchange sold.....	14,848	15,410	18,280	18,786
Foreign bills of exchange purchased..	14,297	14,397	15,773	17,514
Collections:				
Proceeds remitted abroad	4,821	4,321	4,625	4,713
Proceeds received from abroad....	4,967	4,515	4,587	5,178
Cash:				
Remitted abroad.....	523	980	349	597
Received from abroad	1,029	905	669	1,023
Commercial credits:				
Opened through domestic banks for foreign account	743	397	628	672
Opened abroad for domestic account.....	1,265	1,339	1,155	846

^a *Anuario Estadístico*, 1937, 1938, 1939.

^b The annual figures for 1940 were computed from monthly averages of Jan.-Mar., Apr.-June, July-Sept., and Oct.-Dec., and may vary slightly from actual annual totals.

Dominated as they are by sugar, some of the figures cannot be considered significant in themselves.

Collections show a slight decline but are fairly well balanced between those received and remitted. Commercial credits also show some decrease over the period. The principal feature here, but not one of particular significance, is that credits opened abroad for domestic account are about double those opened in the Republic for foreign account. In the main this probably represents the operations of the small merchant and trader, and the adverse balance ranging from but \$500,000 to \$1,000,000 per year may approximately represent the foreign trade balance of this group. Nor is the currency movement of much greater significance, for circulation needs rise with population growth and with the application of the service charge to the small bank account. In the foreign operations

of the banks the principal item is drafts and bills of exchange, bought and sold, and the volume indicates that the banks are contributing their full share toward facilitating the foreign trade of the country.

Of wider interest and greater significance are the principal consolidated items of the general banking position and the changes they denote. These are set forth in the accompanying table showing deposit liabilities, and loans, foreign balance, and cash assets of the three Dominican banks as of January 1937 and December 1940.

BANKING POSITION IN 1937 AND 1940
(In thousands of dollars)

Date	Deposits	Loans	Cash	Due from Foreign Banks ^a
Jan. 31, 1937.....	7,139	3,731	1,452	1,956
Dec. 31, 1940.....	9,778	3,847	1,846	4,085
Increase.....	2,639	116	394	2,129
Low.....	7,087 ^b	3,247 ^c	1,211 ^d	...
High.....	9,778 ^e	4,685 ^f	2,077 ^g	...
Range.....	2,691	1,438	866	...

^a Computed by subtracting loans and cash from total deposits. These amounts very largely represent the balances of the three Dominican branch banks with their respective head offices in the United States and Canada.

^b Dec. 31, 1937.

^d Feb. 28, 1937.

^f Feb. 29, 1940.

^c Sept. 30, 1938.

^e Dec. 31, 1940.

^g Oct. 31, 1940.

The figures show important change. In the three years, deposits increased \$2,639,000, and this increase is almost wholly equalled by the expansion of foreign balances and bank cash. On balance, loans were but \$116,000 greater. The increase in bank cash of almost \$400,000 is not of itself important, but when combined with the rise in foreign balances, amounting to \$2,129,000, it becomes clear that the larger deposits served no purpose but to increase the cash position of the banks themselves, and that 84 per cent of this increase accrued, or was transferred, outside the country.

Of even greater significance are the figures for 1940, for major changes took place in that year. The table on page 247 gives a more detailed breakdown of the figures. During 1940 combined

demand and savings deposits increased \$1,873,000, with the bulk of the increase in the former. Combined loans decreased \$767,000, with about one-third of the decrease in mortgage loans and the balance in the other categories. There was relatively little change in bank cash, but foreign balances of the banks increased \$2,603,000.

The net result was a fairly sharp deflation of bank credit through reduction of loans, and a pronounced rise in the cash position and bank liquidity through an increase of balances held abroad. If the

BANKING POSITION IN 1940
(In thousands of dollars)

Date	Deposits		Loans		Cash	Due from Foreign Banks
	Demand	Savings	Mortgage ¹	All Other		
January 1940	5,203	2,702	2,627	1,987	1,809	1,482
December 1940	6,610	3,168	2,380	1,467	1,846	4,085
Change	+1,407	+466	-247	-520	+37	+2,603

contraction of bank credit was the deliberate result of bank policy, it unquestionably served to deflate further an already sagging economy. On the other hand, it is equally possible that the bank figures merely reflected the consequences of general economic debility. Though the former conclusion may be true regarding one of the banks, it is improbable as regards the other two.¹⁷ In the absence of segregated bank figures the facts cannot be accurately determined, but it seems probable that the desire of one bank for a high degree of liquidity did exert some deflationary influence upon the national economy at the time.

With the exception mentioned above, the Dominican banks cannot be accused of failure to function in their capacity as commercial institutions. During the three years under review the low point on loans was \$3,247,000 at the end of September 1938, from which point loans expanded to the high of \$4,685,000 on February 29, 1940, an increase of almost \$1,440,000. With the exception noted, the small volume of loans is due more to the absence of opportunity and acceptable risks than to any basic desire for high liquidity.

¹⁷ In 1941, when the local branch of The National City Bank was offered for sale to the Dominican government, 80 per cent of its assets were in cash.

Finally the banks' figures indicate ability on the part of the banks to take up the slack in outstanding currency which otherwise might have found its way back to the United States. And from a strictly banking standpoint, foreign balances—large or small—are inherent in a system of branch banks with head offices abroad. If the parent banks are prepared to serve as reservoirs of credit should occasion or opportunity arise, there can be no valid objection to their also serving at other times as the repository of unusable funds.

The following table shows, in thousands of dollars, the position of the banks on December 31, 1940, in slightly different form.

Demand deposits	6,610	Bank cash	1,846	
		Due from foreign banks	4,085	
			<hr/>	5,931
Savings and time deposits	3,168	Loans:		
		Mortgage	2,380	
		Other	1,467	
			<hr/>	3,847
Deposit liabilities	9,778			<u>9,778</u>

In this statement demand deposits are almost 90 per cent covered by cash at home and abroad. If short-term¹⁸ and callable loans are included as the equivalent of cash, the coverage is 100 per cent. At the same time, savings deposits are fully covered by term loans even if short-term advances are deducted. The matter of quality of the loans is in part protected by the system of United States and Canadian bank examination. Some of the mortgage loans may not be the best in the world, and collection of some of the others might conceivably be slow. However, considering the nature of the banks, the relatively small amount involved, and the resources of their parent affiliations, this question does not arise. On the evidence and as going institutions, the banks doing business in the Dominican Republic must be regarded as highly liquid and highly solvent.

IV. SUPPLY OF MONEY

Bank money in the form of deposits represents only a part of the total money supply. The total supply consists of bank money plus currency, including subsidiary coinage.

¹⁸ \$574,000 on Dec. 31, 1940.

In the following table an attempt has been made to show the total supply of money in the Dominican Republic as of January 1937 and December 1940. The figures for bank money are taken from the consolidated bank statement. The currency figures, other than currency in banks, are admittedly estimates based on the best guess of competent authorities, for, as already noted, there are no exact data on currency in general circulation. The net import of currency by banks during the period is a matter of record. Under the circumstances the figures for total supply shown in the table

ESTIMATED MONEY SUPPLY, 1937 AND 1940
(In thousands of dollars)

Money Supply	Jan. 31, 1937	Dec. 31, 1940	Increase
Bank money ^a	7,139	9,778	2,639
Currency:			
In banks	1,452	1,846	
In circulation	1,871 ^b	2,654	
Total currency . . .	3,323 ^c	4,500 ^c	1,177
Total supply of money . .	10,462	14,278	3,816

^a Bank deposits.

^b Based on estimated volume of currency and coinage in the country at the end of 1940 totaling \$4,500,000, less a net import of \$1,177,000 during the period, and less currency in banks Jan. 31, 1937.

^c Estimates of volume of total currency in the country. Except for currency in banks there are no data on the volume of currency in the country. This figure is therefore the estimate of the local bankers, and no claim for anything more than approximate accuracy is made for it.

may be regarded as closely approximating the actual amount available.

During the four years, total money supply of the Republic increased from \$10,462,000 to \$14,278,000. The increase was made up of an expansion of \$2,639,000 in bank money and \$1,177,000 net import of cash. It must be assumed that the added currency remained in the country in response to demands of population growth and as a consequence of the service charge on small holdings of bank money (deposits), but the increase in supply of bank money itself very largely accrued abroad in the form of an increase of \$2,129,000 in foreign balances.

In this connection the figures in the table on page 250 are of interest.

Of the total supply of money, amounting to some \$14,000,000 on December 31, 1940, only about half was available for immediate use inside the country without drawing upon savings or repatriating funds held abroad by the banks. This sum is further reduced to around \$5,000,000 by the banks' practice of habitually carrying

DISTRIBUTION OF MONEY SUPPLY
(In thousands of dollars)

Type	Jan. 31, 1937		Dec. 31, 1940	
Bank money:				
In the Republic	5,183		5,693	
Held abroad	<u>1,956</u>	7,139	<u>4,085</u>	9,778
Currency:				
In banks	1,452		1,846	
In circulation*	<u>1,871</u>	3,323	<u>2,654</u>	4,500
Total supply of money		10,462		14,278

* Estimated.

about 20 per cent cash reserve against deposits. The probabilities are that the effective money supply in the Republic at any given time is never much more, and often somewhat less than 50 per cent of the total indicated supply.

There is nothing in the bank figures to indicate national affluence, and a great deal to confirm a low state of economic development. Within the limits prescribed by commercial banking practice and by the Dominican economy, there is every reason to believe that the banks are functioning to the fullest extent permissible. It may be possible to expand credit facilities beyond the commercial field and thus give some added stimulus to production, but in the area for expansion lies a good deal of risk. In the main it includes agriculture with its unstable yields, markets, price structure, and land values. Financially, agricultural difficulties arise more often from overindulgence in credit than from inaccessibility of credit. And there are few branches of agriculture which can long support a 10 per cent interest rate. Altogether it will take an adroit helmsman to navigate successfully such tortuous credit channels as these.

CHAPTER XVI

PUBLIC FINANCE

The conduct of a nation's financial affairs, including the amount and objects of government expenditure and the extent and character of the taxes levied, must be considered in any appraisal of its economic development and possibilities. This is particularly true in the Dominican Republic, where per capita income is low and much of it, represented by the imputed value of farm production consumed at the source, is not available for tax payments. In this chapter, government expenditures and revenues, taxation, and the public debt are discussed, especially in relation to the problems of immigrant settlers.

I. GOVERNMENT EXPENDITURES

Expenditures of the national and local governments since 1937 have remained close to \$13,000,000 annually. While this sum indicates that the cost of government is only about \$8 per capita, this annual burden is high in comparison with the per capita national income of about \$40.

In the United States in 1937, governmental expenditures (federal, state, and local) took nearly 24 per cent of national income.¹ On a per capita basis, this amounted to expenditures of approximately \$129 against income of \$540. In the four years 1937-40, governmental expenditures took about 25 per cent of national income. While costs have consumed a greater proportion of income in the United States than in the Dominican Republic, the burden on the Dominican taxpayer has been greater because of his low income and his comparatively low standard of living. High government costs in the United States reflect, in large part, the cost of government aid and benefits of many kinds. In the Dominican Republic, government funds necessarily must be expended almost entirely for the support of essential government services.

After paying for the maintenance of essential services, the Do-

¹ National Industrial Conference Board, *Economic Almanac*, 1941-42, p. 359.

minican government each year has small sums left to expend for promoting the development of the country's resources and for expanding production. In this respect, the Republic is better situated than some of the more backward countries of Latin America. Material progress has been made in improving highways and harbor facilities. The expenditure of considerable amounts for municipal improvements in Ciudad Trujillo has been a particularly striking feature of the government's recent program. Model farms have been established, and some technical aid has been given to agriculture. Expenditures for developmental purposes, however, chiefly benefit small isolated groups of the population; or they are so thinly distributed as to give no noticeable advantage to the average Dominican family.

European settlers coming to the Dominican Republic have lived in countries whose governments are expected to provide important social and material benefits. This public function is looked upon in larger countries as a normal obligation of the government to the governed. The figures quoted emphasize the fact that the Dominican government financially is quite unable to provide services comparable to those which larger communities are customarily able to render. Even though economic conditions, and perhaps colonization itself, were to bring a wave of prosperity to the Republic, it is unlikely that the government would find it possible to provide social services, and perhaps technical aid to agriculture and industry, which would approach the activities in these directions assumed by the governments of larger countries. This is a fundamental difference between European standards and the new standards to which settlers must accustom themselves. Educational and health facilities, and social benefits in general, must be largely furnished by the immigrant movement, and not at the cost of the Dominican government. The immigrant communities themselves must supply their technical and financial needs for agricultural production, and they must furnish their own civic betterments when they can afford them.

The budget. The annual budget of expenditures is particularly useful as an indication of government fiscal policies, and as a measure of the extent to which the government may be able to assist agriculture and provide public facilities for education, health,

and other services of special interest in connection with the settlement problem.

The budget is published in detailed form. Budget estimates have been conservative, and receipts during the past several years usually have exceeded estimates by a wide margin. Total appropriations have shown a tendency to increase each year, and new taxes providing increased revenues have been imposed to cover the increases. From appropriations totaling \$10,552,000 in 1937, the annual total increased to \$12,156,000 for 1941.

The Dominican budget is properly constructed in that it apparently covers all ordinary and foreseen needs of the government. There is no evidence that known expenditures are purposely omitted in the expectation that a hoped-for revenue increase at some later date will permit the voting of deficiency appropriations. Accurate revenue forecasts, regularly balanced budgets, and close control over expenditures furnish some evidence that the finances of the Republic are conservatively and competently administered. Legislative participation in control over the budget is not sufficiently important under the present highly centralized government to merit an examination into this aspect of the administration of Dominican finances.

Because the government had not issued a detailed accounting of expenditures, the budget was the only source of detailed information regarding the disposition of government revenues.² Analysis of ex-

² A recently published report (*Informe Año 1941 Que . . . Presenta El Contralor y Auditor General de la Republica, 1942*), however, presents a statement of expenditures for the year 1941 by objects of expenditure and by government departments. Expenditures in 1941 from the general fund, according to this report, were as follows (in thousands of dollars):

Salaries	6,082	Interest	912
Wages (day laborers)	256	Pensions	76
Supplies	837	Subventions	381
Material	10	Amortization, public debt	496
Communications	57	Equipment	247
Traveling expenses	101	Land (<i>terrenos</i>)	48
Transportation	117	Construction and permanent im-	
Printing	79	provements	399
Light, water, and power	51	Reimbursements, claims, and in-	
Rentals	146	demnities	130
Repairs and alterations	172		
Maintenance of motor vehicles	208	Total expenditures, general	
Miscellaneous	521	fund	11,326

penditures, therefore, is necessarily on the basis of appropriations rather than actual disbursements. This is satisfactory for present purposes except that it is not possible to make proper allowance for unexpended appropriations, diversions of funds from one appropriation to another, and new appropriations opened during the course of the year from surplus revenues.

The relation between budget allocations and annual government receipts during the past four years is shown by the figures below (in thousands of dollars):

	Budget of Expenditures	Government Receipts	<i>Difference</i>
1937	\$10,552	\$11,562	+ \$1,010
1938	11,682	12,089	+ 407
1939	11,483	12,367	+ 884
1940	12,135	12,098	— 37
Net excess of receipts			\$2,264

Since revenues have exceeded ordinary appropriations by over \$2,000,000 during the last four years, allowance should be made, in the discussion regarding expenditures, for the fact that about \$500,000 per year presumably has been appropriated for deficiency and extraordinary purposes. Furthermore, there have been numerous diversions of funds from one appropriation to another during the course of the year which are not reported in any comprehensive list of supplementary or extraordinary appropriations.

The Dominican government in important respects follows United States budgetary practice in accounting for government expenditures. Annual budgetary allocations, by general and special accounts, are presented in the table on page 255. Government expenditures, so far as available information shows, have been judiciously handled. The distribution of expenditures shows a reasonable allocation of revenues, in view of the means at the disposal of the treasury and the needs of the government. Funds needed for debt service amount to about 10 per cent of total appropriations. The high expenses for public security may be justified, particularly when it is considered that the items include all costs in connection with functions performed in larger countries by police forces paid from municipal revenues. The cost of maintaining the judiciary may

BUDGET OF EXPENDITURES OF THE DOMINICAN GOVERNMENT, 1937-41^a
(In thousands of dollars)

Object of Expenditure	1937	1938	1939	1940	1941	
					Amount	As Percentage of Total
GENERAL ACCOUNT						
Legislative Power	203	209	277	276	306	3
Executive Power	287	287	287	289	283	2
Interior and Police ^b	383	438	504	516	623	5
Army, Navy, Aviation ^c	1,885	1,842	1,879	2,070	2,128	17
Office of the President	138	190	195	316	716	6
Office of the Generalissimo	—	—	—	—	29	—
Foreign Relations	402	457	453	482	348	3
Treasury and Commerce ^d	1,064	1,179	1,084	1,211	1,179	10
(public debt service) ^e	—	—	—	—	1,230	10
Chamber of Accounts	16	16	18	18	15	—
Agriculture, Industry, and Labor ^f	220	320	400	413	306	2
Commerce ^g	106	117	—	—	—	—
Communications ^h	387	436	486	510	437	4
Public Works ⁱ	1,260	2,008	1,417	1,393	1,677	14
Health, Public Assistance	402	408	478	500	453	4
Public Education, Fine Arts ^j	1,033	1,094	1,249	1,342	1,319	11
Justice	28	44	—	—	—	—
Judicial Power	703	732	860	863	887	7
Total, general account	8,517	9,777	9,587	10,199	11,936	98
SPECIAL ACCOUNTS						
Treasury and Commerce ^k	1,690	1,403	1,551	1,589	65	—
Agriculture	7	7	8	—	—	—
Health and Public Assistance	—	45	67	77	85	—
Public Education and Fine Arts	—	50	70	70	20	—
Executive Power	338	400 ^l	200 ^m	200	50	—
Total, special accounts	2,035	1,905	1,896	1,936	220	2
Total government expenditures	10,552	11,682	11,483	12,135	12,156	100

^a *Anuario Estadístico*, 1937, 1938, 1939, and *Ley de Gastos Públicos*, 1941.

^b Interior, Police, War and Navy (1937 and 1938).

^c Given as a sub-account under Interior, Police, War, and Navy, 1937 and 1938.

^d Treasury (1937 and 1938).

^e Included among special accounts prior to 1941.

^f Agriculture (1937 and 1938).

^g Commerce, Industry, and Labor (1938).

^h Communications and Public Works (1937, 1938, 1939).

ⁱ Designated as "Commerce and Public Works (Public Works)" (1937).

^j Designated as "Justice, Public Education and Fine Arts" (1939).

^k Includes public debt service (1937-40).

^l Designated as "Executive Power (Plan for social and economic betterment and payment of claims)."

^m Designated as "Executive Power (for the Plan for social and economic betterment, and other unforeseen matters, as directed by the Executive Power, and for the payment of claims)."

appear a trifle high, and funds left for public health, education, and agriculture are undoubtedly low, particularly when it is considered that agriculture is the mainstay of the Republic's economy.

Expenditures by objects. The government pay roll amounted to about \$5,600,000 in 1939, including salaries of employees of the Customs Receivership. The total government pay roll was about 46 per cent of expenditures in that year. The federal pay roll in the United States in 1938 amounted to about 40 per cent of general expenditures, while in the Republic of Haiti, pay-roll disbursements in 1937 amounted to 53 per cent of total expenditures.

Cabinet ministers receive \$6,000 per year, members of the legislative body \$4,000, and judges of the supreme court \$4,200. Technicians and professionals in government service usually are paid salaries ranging from about \$1,000 to \$1,500 per year. Stenographers and typists receive \$35 to \$75 per month, chauffeurs about \$30, and messengers as little as \$5 per month. Following typical Latin American practice, 10 per cent of all salaries of government employees is deducted for the use of the political party in power.

The sum of \$450,000 was allotted in the 1941 budget for current expenses of government departments and offices. The item does not include many special allocations for similar costs listed separately in the departmental budgets, but it is sufficiently inclusive to indicate the scale of government operations. The largest item, about \$117,000, is for rentals of private buildings used by government offices; \$90,000 is for supplies; \$34,000 is for office equipment; and \$27,000 is for traveling expenses. Other cost items are: "special and miscellaneous," \$42,000 (chiefly for foreign relations); insurance, \$37,000; acquisition of motor vehicles, \$36,000; maintenance of motor vehicles, \$60,000; printing, \$22,000; water, light, and power, \$19,000; and communications, \$17,000.

The government appropriated \$198,480 for payment in 1941 of subventions to private and semi-private schools and for scholarships. This sum is included in the total, already referred to, expended by the government for education in 1941.

The budget of the Public Works Department for 1941 includes \$125,000 for civic improvements in the capital city. The public water supply and sewer system in the same city is administered by

the national government at an annual cost (1941 budget) of about \$100,000. Since receipts from water-service subscriptions totaled \$140,000 in 1939, the service appears to be operated at a small profit to the government.

Government irrigation systems are operated at a cost of \$63,000 (1941). Port improvements at Ciudad Trujillo will cost more than \$200,000 according to the 1941 budget, but most of this amount is to pay for work already completed under contract. Miscellaneous costs for maintenance and construction of harborworks total \$118,000 in the 1941 budget.

The government appropriates about \$80 per mile of road for maintenance, the 1941 budget carrying a total of \$240,000 for this purpose. There are about 3,000 miles of roads, including municipal dry-weather roads. It appears doubtful that the sum mentioned is adequate for much more than unavoidable road repairs. Appropriations for new roads (\$118,000) are the only important new construction projects contemplated in the 1941 budget for public works.³

The postal service appears to operate at a loss, with budgeted expenditures in 1941 totaling about \$300,000, and postal receipts, which are covered into the treasury, totaling \$182,000 in 1939 (estimated at \$189,000 for 1941).

It has already been pointed out that the Dominican government's outlay for agriculture is small. The 1941 total of \$375,000, including government costs in connection with industry and labor as well as agriculture, is distributed among the following principal items:

Administration	\$ 73,200
Current expenses	43,700
Agricultural services	53,800
Acquisition of seeds	2,000
Colonization:	
Personnel	24,800
Acquisition of land	25,000
Miscellaneous expenses	6,000
Livestock	18,600
Agricultural chemistry	8,400
Agricultural development (purchase of farm implements, \$2,000; labor and expenses, \$5,000)	7,000

³ The appropriation of \$400,000 for construction of the new national hotel has been diverted to other purposes.

Publications and information	6,100
Transportation	8,800
Forestry, fisheries, game	22,600
Investigation of economic, industrial, and mineral resources	25,000
Development and regulation of commerce and industry	25,000
Chambers of commerce	25,000
Total	\$375,000

The foregoing items include \$43,700 appropriated for current agricultural expenses in the special budget chapter covering the executive office. Even with this item included, the total is not great, and a substantial portion of the total is for non-agricultural activities.

The Department of Agriculture employs about 245 persons, of whom about 60 are trained specialists, including inspectors and instructors as well as agronomists, entomologists, and pathologists. In appraising the need for such a staff, it should be considered that the Department of Agriculture is responsible for the welfare of the largest segment of the population and is the organization through which the most effective work can be accomplished in the program of economic betterment. The Dominican government spends only 2 per cent of its receipts for agriculture. Of the 60-odd private schools receiving government subventions or scholarships, not one is a school which specializes in teaching technical agricultural subjects. Furthermore, there is no private organization comparable in its functions to the National Grange or the American Farm Bureau Federation which can supplement the government in promoting the welfare of the farmers. The universities and colleges teach classical studies, art, and business to the exclusion of the agricultural sciences.

Treasury Department expenditures are chiefly for salaries of the tax-collecting personnel, administration of the public debt, and similar fixed costs of the government. Items of special interest in the budget of this department are the pension list, totaling \$72,000 annually, and another amount totaling \$72,000 "to promote the development of the National Merchant Marine." The pension list is small and reasonably in keeping with the country's resources. The merchant marine subsidy, in view of the present shipping situation, may be found to have been a judicious measure.

The Department of Foreign Relations expends a total of

\$348,000, of which about \$258,000 is to support diplomatic and consular representation abroad.

Municipal expenditures. Local governments during 1937-39 each year expended sums totaling slightly under \$1,000,000, as shown in the table below.

The national government exercises close supervision over municipal finances. The financial condition of the individual local governments, or *ayuntamientos*, is reported to be sound. Sums owed

MUNICIPAL RECEIPTS AND EXPENDITURES, 1937-39^a
(In thousands of dollars)

Object of Expenditure	1937	1938	1939
MUNICIPAL RECEIPTS	1,000	1,046	1,051
MUNICIPAL EXPENDITURES	996	945	928
Salaries and current administrative ex- penses	211	224	234
Public works	183	154	170
Public lighting	134	137	139
Service of municipal debt	135	113	101
Public instruction	59	53	57
Band concerts	54	57	58
Bonds returned	36	40	12
Health and public assistance	14	14	15
Fire departments	9	8	9
Parks and gardens	9	11	12
Libraries	3	3	4
Others	149	131	117

^a Compiled from *Anuario Estadístico*, 1937, 1938, 1939.

by municipalities to the national treasury had been reduced from \$806,000 at the end of 1937 to \$650,000 on December 31, 1939. There is no funded or other internal debt of the municipalities except the sums owed to the national treasury. Debt retirement has been rapid, amounting to over 10 per cent of total annual expenditures of the municipalities.

Following usual Latin-American practice, the municipalities are charged chiefly with maintenance of streets, operation of water-works, disposal of refuse, street lighting, fire protection, and similar functions. Educational and health activities are primarily a function of the national government, although the municipalities reported a total of \$72,000 expended for these purposes in 1939. The national government is charged with all duties connected with public security and the administration of justice.

The table shows that from a fiscal standpoint the activities of the

municipalities are unimportant. Salaries and administrative expenses are the chief item in the municipal budget, amounting to about a quarter of the total. Public works (streets, drainage, etc.) are next in importance (18 per cent of the total), followed by street lighting (15 per cent).

II. REVENUES

Total receipts. Total receipts of the Dominican government during the past five years have been remarkably steady. This may be attributed partly to the absence of trade fluctuations—for excepting a drop in import values in 1938, foreign trade has been relatively stable in value—and partly to new taxes, particularly consumption taxes, which have yielded new revenues and compensated for revenue declines in some tax schedules.

Until 1941, fiscal operations of the recently abolished Customs Receivership were accounted for separately in most official reports of government receipts. For present purposes it is more instructive to include customs and others revenues collected by the Receivership as a part of total government receipts, and to classify receipts somewhat differently from the way they are officially presented. In particular, the so-called “imposts” derived from taxes on imports have been combined with other charges on imports and exports. With these changes, the receipts of the Dominican government from 1937 to 1939, in summary form, and budget estimates for 1941, were as follows (in thousands of dollars):

	1937	1938	1939	1941
Customs receipts	6,180	6,124	6,255	6,171
Internal revenues	4,365	4,392	4,805	5,157
Miscellaneous receipts	1,017	1,572	1,307	839
Total	11,562	12,088	12,367	12,167
Municipal receipts	1,000	1,046	1,051	
All receipts	12,562	13,134	13,418	

Per capita receipts were \$7.60 in 1937, \$7.96 in 1938, and \$8.13 in 1939. Total government receipts for 1940 were reported to amount to about \$12,098,000, or about the same as in 1938. In view of the small change in total revenues, it may be presumed that changes in tax yields from various sources were not important. Exports in 1940 remained in value at about the 1939 level.

The foregoing report of government receipts presents an unusual record of revenue stability, particularly when it is recalled that the Republic is a one-crop country with half its revenues directly dependent upon the movement of foreign trade.

Customs receipts. Customs receipts, by categories, are presented for 1937-39 in the table below and on pages 262-63. About half the average total, of slightly more than \$6,000,000, is collected under the tariff of January 1, 1920. This tariff has remained in effect without modification since 1920 because of restrictions placed on changes in the tariff legislation so long as customs duties were being collected under the Customs Receivership. From time to time, however, in order to obtain needed revenues or to offer protection to domestic industries, the government has applied imposts (*impuestos*) on "articles and merchandise which may be introduced into the country" (Law 854, Article I). Most of the important imposts of this kind have been assembled in Law 854 of March 13, 1935, which in effect constitutes a supplemental tariff on imports. Revenues from this supplemental tariff amount to about 20 per cent of total customs receipts as classified in the table below.

RECEIPTS OF THE DOMINICAN GOVERNMENT, BY SOURCES AND ACCOUNTS,
1937-39, WITH BUDGET APPROPRIATIONS FOR 1941
(In thousands of dollars)

Source and Account	1937	1938	1939	1941 (Budget)
CUSTOMS RECEIPTS				
Customs duties	2,944	2,971	3,148	2,950
Internal revenues on imports^a				
Taxes on imports specified in Law 854. . . .	1,544	1,353	1,397	1,500
Cargo tax on imports, exports, coastwise trade.....	834	977	949	1,100
Consular fees.....	352	271	312	300
Excise on gasoline and alcohol ^b	200	210	190	50
Customs documents.....	116	98	107	110
Excise on imported flour.....	82	80	92	100
Excise on imported rice.....	30	112	9	—
Port charges.....	63	52	50	60
Aqueduct tax.....	14	—	—	—
Miscellaneous receipts.....	1	—	1	1
Total internal revenues on imports. . . .	3,236	3,153	3,107	3,221
Total customs receipts.....	6,180	6,124	6,255	6,171

RECEIPTS OF THE DOMINICAN GOVERNMENT, BY SOURCES AND ACCOUNTS,
1937-39, WITH BUDGET APPROPRIATIONS FOR 1941—*Continued*
(In thousands of dollars)

Source and Account	1937	1938	1939	1941 (Budget)
INTERNAL REVENUES				
Urban property tax.....	—	—	34	70
Excise				
Sugar.....	892	873	863	950
Alcohol.....	448	413	382	400
Cigarettes.....	431	457	458	475
Cigars.....	80	69	67	75
Molasses.....	210	211	232	280
Matches.....	144	139	112	140
Alcohol and gasoline.....	87	86	70	5
Beer.....	63	54	57	60
Hulled rice.....	44	167	327	200
Domestic lumber.....	23	60	65	67
Flour (milled in the Dominican Republic).....	10	8	8	10
Wines.....	3	3	2	2
Consumption tax (Law 113).....	—	—	—	200
Bottling tax, liquors.....	—	—	—	20
Total excise.....	2,435	2,540	2,677	2,954
Licenses				
Business.....	351	346	352	350
Importers.....	307	272	298	290
Exporters.....	90	74	102	100
Motor vehicle licenses.....	170	174	196	108
Immigration.....	100	132	223	190
10 per cent surtax, Chamber of Commerce.....	75	69	75	70
Insurance companies.....	21	20	24	25
Firearms.....	9	10	12	12
Certificates of good health.....	—	13	24	21
Incorporation.....	3	3	3	4
Radio broadcasting installations.....	1	2	2	1
Narcotics, sale and certificates.....	5	6	7	12
Others.....	1	1	2	2
Total licenses.....	1,133	1,122	1,320	1,185
Fees				
University and normal school fees.....	22	28	36	36
Other fees (consular fees, registration fees, mortgage recording fees, naturalization fees).....	26	26	29	22
Total fees.....	48	54	65	58
Rents and royalties				
National lottery.....	208	208	212	208
Others.....	3	3	2	2
Total rents and royalties.....	211	211	214	210

RECEIPTS OF THE DOMINICAN GOVERNMENT, BY SOURCES AND ACCOUNTS,
1937-39, WITH BUDGET APPROPRIATIONS FOR 1941—*Continued*
(In thousands of dollars)

Source and Account	1937	1938	1939	1941 (Budget)
Miscellaneous				
Capitation tax (identification cards)	400	397	411	630
Documentary stamps	180	176	186	190
Inheritance and gift taxes	—	—	20	40
10 per cent tax on passage tickets	—	—	15	10
Others (cadastral surveys, lottery prizes, surety bonds, public services, civil register, miscellaneous and special)	169	103	111	90
Total miscellaneous	749	676	743	960
Postal receipts				
Stamp sales	132	145	156	170
Others	33	28	26	19
Total postal receipts	165	173	182	189
Telegraph and radio receipts	35	33	34	31
Water service, Ciudad Trujillo	127	127	140	150
Fines and extra charges	36	44	45	43
Official Gazette subscriptions and similar receipts	7	11	5	4
Sales of services				
Handling (<i>arrimo</i>)	130	123	119	100
Bridge and road tolls	48	67	78	75
Total services	178	190	197	175
Interest on deposits	17	10	16	16
Total internal revenues	5,141	5,191	5,638	5,975
NON-REVENUE RECEIPTS				
Seigniorage	—	283	51	13
Sales of gasoline, oil, and grease	137	183	221	—
Contributions, <i>ayuntamientos</i> (municipal schools)	59	53	56	—
Others	45	38	75	8
Total non-revenue receipts	241	557	403	21
TRANSFERS AND REFUNDS	—	216	71	—
Total government receipts	11,562	12,088	12,367	12,167

^a Officially these receipts are classified as "internal revenues," but in effect they are customs surtaxes and charges of various kinds.

^b Chiefly gasoline.

The cargo taxes are another important source of customs revenues, yielding in 1939 about \$949,000. Government statistics unfortunately do not segregate receipts from these taxes by sources, although the taxes apply to exports and to coastwise trade as well as to imports. On the basis of computations made by applying the appropriate tax rates to the volume of trade in the three categories mentioned, the cargo taxes yielded in 1939 about \$346,000 from imports, \$600,000 from exports, and \$3,000 from the coastwise trade. The tax applied to exports consequently is in reality an export duty, and since it is a specific charge on exports (as well as on imports and coastwise trade) it affects, in particular, heavy products such as mahogany, dyewoods, *lignum vitae*, and other forest products. This is of some interest in connection with immigration, since the tax evidently diminishes the possibility of selling in the foreign market logwood and other heavy forest products cut from land cleared by settlers. Logwood is found in most parts of the Republic, but at present it is not a commercial export.

Other customs revenues listed in the table are relatively unimportant. The sharp rise in receipts from the excise on imported rice followed the addition in 1937 of nearly 2 cents per kilogram to the duty and impost on rice, making a total charge of slightly more than 5 cents per kilogram on imported rice. Receipts subsequently dropped off to almost nothing as domestic production increased under the protection of the heavy import charges.

The item given in the table for total customs receipts does not include all charges applied to foreign trade. An important source of revenue is the license fee imposed on exporters and importers, yielding \$400,000 in 1939. The exporters' license amounts to half of 1 per cent of the value of all commodities exported. The importers' license was originally fixed at 3 per cent and has since been increased by a surcharge amounting to 10 per cent of the original fee. In reality, these license fees are additional *ad valorem* duties on exports and imports.

The handling charge (*arrimo*) is listed by the government among "sales of services." Actually it is an additional customs charge. Receipts amounted to \$119,000 in 1939.

Taking 1939 as a basis, and adding import and export licenses,

together with the handling charge, customs receipts of all kinds would comprise 54 per cent of all government receipts in 1939. Import duties and other charges on imports would account for about 48 per cent of all government revenues.

Export duties as a source of revenue are not unusual among Latin-American countries. Charges on exports are easily collected, and they constitute a convenient means of obtaining revenues. Most of the coffee entering world trade is taxed in the producing countries by means of export duties or charges having the same effect. Comparisons are difficult to make, but it is probable that the Dominican Republic penalizes the producer no more, through revenues derived from exports, than most tropical American countries.

The emphasis on import duties as a source of revenues is also characteristic Latin-American practice. Import duties are relatively easy to collect, the cost of collection is low, and they are an indirect form of taxation suited to Latin-American countries because of the traditional dislike of direct taxes such as United States and British property taxes.

Internal revenues. Internal revenue receipts in most categories have shown no recent change of any significance with the exception of the excise on rice. The latter tax has been increased, through two successive changes, from 50 cents per 100 pounds to \$1.00 per 100 pounds. At the same time imports of rice have been nearly eliminated through the imposition of the additional customs duty of \$1.75 per 100 kilograms under the law of August 2, 1937, and domestic production has increased greatly under the stimulus of tariff protection. The levying of higher excise taxes on domestic rice, combined with increased domestic production, lifted the annual yield of the excise on rice from only \$44,000 in 1937 to \$327,000 in 1939. These tax changes should be observed with particular care in connection with the later discussion of government fiscal policies.

About half the internal revenue receipts are derived from excise taxes on domestic commodities, particularly sugar (for domestic consumption), cigarettes, alcohol, rice, molasses, and matches. The balance consists chiefly of license-fee collections (especially the previously mentioned *ad valorem* "license" charges on exports and imports, business licenses, motor vehicles licenses, and immigration

permits), the capitation tax (identification cards or *cédulas*), and sales of documentary stamps. The relative importance of these sources of revenue, on the basis of 1939 tax returns, is shown by the figures below (in thousands of dollars):

Licenses	Dollars	Per Cent
Exporters and importers	400	19
Business	352	17
Immigration permits	223	10
Motor vehicles	196	9
Other license fees	149	7
Miscellaneous		
Capitation tax	411	19
Documentary stamps	186	9
Others	211	10
Total internal, except excise	2,128	100

Miscellaneous receipts. Miscellaneous receipts of the government are derived chiefly from services operated by the government (postal, telegraph, and radio services, and water service at Ciudad Trujillo), royalties derived from operations of the national lottery, bridge and road tolls, sales of supplies (gasoline and oil), seigniorage obtained through substitution of Dominican subsidiary coins for United States coins formerly in use, and collections of fines and extra charges.

None of these sources of revenue has shown any significant change since 1937 with the exception of seigniorage, which yielded \$283,000 in 1938 following the inauguration of the plan to retire United States coins. The relative importance of the principal items, on the basis of 1939 receipts, is shown by the figures below (in thousands of dollars):

	Dollars	Per Cent
Postal, telegraph, and radio	216	16
Water service, Ciudad Trujillo	140	11
National lottery	212	16
Sales of supplies (gasoline, etc.)	221	17
Handling charges	119	9
Bridge and road tolls	78	6
Other	321	25
Total miscellaneous receipts	1,307	100

III. TAXATION

The tariff. Taxation in the form of import duties and other charges on imports is not of immediate importance to the community of settlers, because of the grant of special tax privileges. The subject is of special interest from a long-range viewpoint, however, because: (1) more than half the total revenues are derived from customs revenues; (2) settlers will not enjoy special customs privileges once they are established; and (3) the economic consequences of high duties on common necessities such as clothing will be reflected in the standard of living which the settlers may be able to attain.

The following sums up the present status of customs and other charges on imports, so far as concerns their effect on agricultural undertakings conducted by the Settlement Association:

1. Colonists may bring with them into the Republic, duty-free, articles "for their own personal use in their agricultural enterprises. . . ." These include furniture, tools, and other articles "which they may need in order to establish themselves with economic solvency."⁴

2. The Association is not subject to payment of property taxes or duties on any transactions "which refer exclusively to the fulfillment of the essential purpose of transporting and establishing within the Republic the settlers referred to in this agreement, or to the carrying out of projects of general interest in the establishment of said settlers, provided they do not imply competition with other similar activities open to private initiative."

Colonists under these provisions are receiving duty-free all the imported equipment which they need to establish themselves.

⁴ This provision is of little value because colonists in most cases are nearly destitute upon arrival so far as concerns personal property they are able to bring with them. Moreover, conventional customs practice in the Dominican Republic, as in other countries, permits free entry of personal property in the case of persons coming to reside permanently in the country. There is no reason to anticipate a change in the existing legislation. Goods "for personal use" brought into the country by immigrants intending to reside permanently in the country constitute an addition to the wealth of the country. Since there is no corresponding remittance of funds abroad, there is no logical reason for restricting such imports by taxation. The significant point of this contractual provision is the emphasis on "agrarian industries." See App. D.

Once they are settled or established, however, they will evidently have to supply their future needs for imported materials in the local market, without special privileges. The full effect of the tariff on the cost of imported necessities, and hence on their standard of living, will be felt only some time after their arrival.

The high cost of imported textiles, clothing, pharmaceutical products, paints, and so forth, will be a severe strain on a very limited family budget. These items together, in value, comprised 30 per cent of total imports in 1939. Precise figures are not available, but because of the specially high duties on textiles and wearing apparel, the same group probably contributed about half of the total revenues obtained by the government from imports in the year mentioned.⁵ This would amount to about \$3,000,000 or nearly \$2.00 per capita.

Although the tariff, as a charge against the cash income of the immigrant farmer, may be a negligible item for a year or so, because each farmer will begin with enough household equipment, clothing, and supplies to last him for some time, the effect of the high cost of ordinary living necessities will make itself felt sooner or later. The immigrant farmer will begin with a farm and equipment appreciably superior to that of the average Dominican. He will seek to maintain a standard of living approaching the European standard for farmers. The per capita tariff cost of \$2.00 paid by the Dominican people for importing necessities will be perhaps \$4.00 or \$5.00 in the case of the immigrant; and as family groups are formed this will represent an annual cash outlay of \$15.00 or \$20.00 for each family.

There are some features of the Dominican tariff which offset the high tax burden applied to textiles, wearing apparel, and other necessities. Imports of agricultural machinery, farm implements, fertilizers, and similar articles of foreign origin in general are duty-free except for the importer's "license" fee of 3 per cent (plus the surcharge of 10 per cent). Relatively low duties (*impuestos*)

⁵ The National Statistics Office reported that on imports of cotton textiles in 1940 valued at \$1,200,000, the government collected duties amounting to \$763,000, indicating a tariff burden of 63 per cent, not including the many indirect and supplementary charges on imports.

are applied under Law 854 to articles such as ordinary tools and implements used for carpentry and other trades (5 per cent ad valorem). Imported construction materials such as steel pipes and pipe fittings pay from 10 to 15 per cent ad valorem. Galvanized roofing sheets are dutiable at a low rate. Carts, wagons, and wheelbarrows are dutiable at 5 per cent ad valorem. Sewing machines are duty-free. Instruments such as thermometers, scientific instruments, gauges, and compasses are duty-free or are subject to low rates under Law 854. Barbed wire for fencing is dutiable at a low rate.

In general, the Tariff Law of 1920 exempted all imported articles commonly used by farmers. In addition, the free list included most materials used in construction and in the building trades; most kinds of machinery; electrical apparatus; plumbing supplies; quinine, vaccines, surgical instruments; paper, printing inks; material used in manufacturing industries, including fuel; and automobile trucks used for transporting goods. Many imported foodstuffs were duty-free, including wheat, rye, barley, and oats. But most of the articles then on the free list are now dutiable under the "imposts" applied by Law 854 for revenue purposes or for protection of domestic industries.

The Dominican farmer, however, still enjoys better tariff treatment than other groups of the population, and the immigrant farmer will benefit equally.

Articles used by farmers specifically exempted by customs rulings from payment of duties and imposts include tractors, feed for animals, crates for farm products, farm implements (machetes, picks, etc.), roofing paper. Dynamite and blasting powder are dutiable at a low rate. Fishing nets of all kinds are free. Other duty-free or tax-free articles of special interest to immigrants are washing machines, stainless steel forks, blank books (for accounting), floor wax, cellophane, crepe paper, coal, asphalt.

In sum, Dominican tariff and tax charges on imports, although the principal source of government revenue, do not impose an inequitable burden on the farm population as a group. Each immigrant farmer, however, must anticipate that some years hence he will be paying indirectly, for himself and his family, some \$15.00 or \$20.00

in the form of duties and imposts on imported living necessities, particularly textiles and clothing.

Excise taxes. The excise taxes are becoming increasingly important as a source of revenue. In 1937 excise receipts amounted to about \$1.55 per capita, and budget estimates for 1941 indicated per capita excise receipts of about \$3,000,000, or \$1.80 per capita.

The stability of Dominican revenues is largely attributable to government emphasis on taxing articles of common consumption, particularly sugar, rice, and, recently, coffee. These three commodities were expected to account for nearly half of the excise receipts in 1941. The balance is made up chiefly of the more conventional excise taxes on alcoholic beverages, tobacco products, and matches. A relatively unimportant tax on domestic lumber produced \$65,000 in revenues in 1939. The excise on molasses, yielding \$232,000 in 1939, is in reality an export duty paid by the sugar industry from earnings.

The \$1,000,000 collected from liquor and tobacco products is derived from taxation of what are really semi-luxuries in the Dominican Republic. Demand is probably more elastic than in the United States, because of the comparatively low national income of the Dominican people. Receipts from this source have remained steady during the past few years.

The consumption taxes on sugar, rice, and coffee are shifted by domestic producers of these commodities to the consumers. Present annual revenues from these sources amount to about 80 cents per capita. The taxes are a burden on the low-income groups, especially those in the cities and towns, since sugar and rice are essential foodstuffs and the tax cannot easily be avoided. From the government's point of view the consumption taxes are ideal because of the steady and sizable revenues they produce. At their present level they form a stabilizing element in the fiscal structure, but they cannot be safely raised.

Licenses. Although license fees contribute 10 per cent of government revenues, the share paid by farmers is relatively small except for that paid indirectly in the form of exporters' and importers' licenses. It has already been pointed out that the exporters' and importers' licenses are only another name for customs surtaxes.

Business licenses, other than the customs surtaxes mentioned,

yielded \$352,000 in 1939. These receipts are obtained from fees paid by business establishments and tradesmen for the privilege of doing business. The tax is a means of controlling business through license regulations, as well as a revenue measure. License fees in general are not high except in the case of large establishments such as sugar-mills (\$100 per set of mills); banking establishments (maximum of \$500 per establishment); steamship agents (maximum of \$75); manufacturers of matches (\$200), soap (\$100), furniture (\$75), hats (\$100), shoes (\$125); bakeries (maximum of \$200); breweries (\$200); distilleries (\$200); automobile dealers (\$200). Restaurants and cafés pay a license amounting to 50 cents for each seat provided for the use of customers. Small handicrafts pay licenses of from \$10 to \$20 per year. Service establishments such as laundries, repair shops, and garages pay license fees on about the same scale. The small meat markets scattered throughout the country pay a tax of \$5 per year. License fees paid by dealers in certain specified commodities are mostly from \$25 to \$50.

Retail and wholesale establishments, with the exception of a few categories specifically mentioned in the license schedule, are licensed on the basis of their inventories, at the rate of \$4 per \$1,000.

None of these license fees are intended to affect the farm population directly, but they, of course, have some indirect effect on the costs of the things the farmers buy. The law specifically exempts "small establishments selling farm products exclusively." Processors of farm products in some cases are required to have licenses. Among these are, besides the sugar industry: rice or coffee hullers (maximum of \$50); chocolate manufacturers (maximum of \$75); sausage manufacturers (\$30); butter and cheese manufacturers (\$25 where output is in excess of certain stipulated amounts); vinegar manufacturers (\$10); flour millers (maximum of \$25); and coffee grinding and roasting mills (\$25). Wholesale dealers in farm products for export, such as cacao and coffee, pay a maximum fee of \$50.

Immigrant farmers engaged in dairying on a large scale eventually will have to pay licenses as indicated. A license is required for manufacturing butter if monthly output exceeds 500 pounds, and for manufacturing cheese if monthly output exceeds 5,000 pounds.

The fee of \$25 in each case does not seem excessive, and immigrant dairy farmers will be on the same footing as Dominican farmers.

The license fees, altogether, appear to present no obstacle to immigrants engaged in general farming. Dairying on a fairly large scale, however, will involve extra costs for licenses, and food processing in general will come under one or another of the license fees. Sausage manufacturing, for example, will require a license (\$30) if total monthly output (including ham, bacon, and smoked meats) exceeds 10 quintals (1,000 pounds).

Since immigrants under the Settlement Association contract are exempt from payment of the usual immigrant permit, this revenue item amounting to the substantial sum of approximately \$200,000 in 1939 may be disregarded in the present discussion.

The only other important item in the group classified as licenses is the sum of \$196,000 collected in 1939 from motor vehicle licenses. Receipts from this source were estimated at \$108,000 during 1941. The tax of \$80 per vehicle is certainly very high according to United States standards; but in the Dominican Republic it is apparently looked upon by the tax authorities, with some justification, as a luxury tax. The high tax cost of motor transportation in effect prohibits its use by the immigrant farmer as an aid to operation of his farm and to efficient distribution of farm products.

Miscellaneous taxes. The capitation tax, requiring all persons to obtain identification cards, will not be a heavy burden on the successful immigrant farmer since the amount payable for the card will be in one of the lower tax categories. Requirements for the submission of photographs, however, in effect add to the annual cost of the tax, and as family groups are formed, the immigrant farmer will find that he will have to set aside several dollars each year to comply with regulations.

The capitation tax was expected to yield \$630,000 in 1941. The measure has been successful as a revenue producer, and it is possible that the government may be led to institute further increases in the tax rates. The scope of the tax only recently has been increased by requiring women as well as men to carry *cédulas* (identification cards). It will be unfortunate if further increases are made, for regardless of how small the amount payable, the fact

that payment is obligatory often places an inequitable burden on those individuals whose cash income is very small. There are persons in any community who fall into this category, and inevitably some of the less successful immigrant farmers will find the small capitation tax a burden. The *cédula* has a proper function as a police regulatory measure, but the collection of revenue should be only incidental.

The national lottery yields over \$200,000 each year in the form of royalties to the government by the entrepreneur (\$212,000 in 1939) and the government tax on prizes (\$24,000 in 1939). In theory, the tax is payable only by those supposedly able and willing to pay. In this respect the lottery method of obtaining revenues, whatever its shortcomings, is free from the fundamental objections to capitation taxes.

Official data covering operation of the lottery are not made public by the government. Estimated operations, based necessarily on incomplete data, show that well over \$1,000,000 apparently changes hands each year through the sale of lottery tickets. Commissions, expenses of administration, the profits of the entrepreneur, government royalties, and the tax on prizes probably reach an amount estimated at a yearly figure in excess of \$400,000. Most of the lottery-ticket money is probably spent by persons living in the cities and towns. The economic and social effects of lotteries should not be an important factor in the lives of hard-working immigrant farmers.

Documentary stamps were expected to contribute \$190,000 to the government treasury in 1941. Most of this sum is contributed by business. The incidence is diffused, and will not be felt by the rural population or by immigrant farmers.

Municipal taxes will not be felt directly by the immigrant farmer except to some extent in connection with the slaughter of animals. The slaughter tax yielded \$258,000 in 1939, which is roughly 15 cents annually per capita. This is a small amount, and is largely shifted by producers to consumers living in cities and towns. A large part of the meat slaughter (chiefly slaughter for farm consumption) escapes the tax.⁶ Municipal taxes affect distri-

⁶ "A certain amount of slaughter to the present time escapes statistical control, consisting of the numerous slaughterings for consumption on farms. . . ." *Anuario Estadístico*, 1939, Vol. 2, p. 177.

bution of farm products and other commodities through taxes on transportation, and on the use of public markets and shelters. Other sources of municipal revenues are taxes on amusements (theaters, cock-fights) and on the execution of various civil acts.

Taxes and the immigrant farmer. The Dominican Republic assures "the settlers and their descendants full opportunity to continue their lives and occupations free from molestation, discrimination or persecution, with full freedom of religion and religious ceremonials, with equality of opportunities and of civil, legal and economic rights. . . ."⁷

It may be assumed, therefore, that immigrants engaged in farming as members of the Settlement Association community will be at no tax disadvantage as compared with the average Dominican farmer. The farmer's taxes, as pointed out, consist first of the indirect taxes he pays in the form of duties on imported necessities, particularly on textiles and clothing, and second, of the small direct tax he must pay for his *cédula*. The excise on tobacco and liquor may cost the average farmer \$2.00 or \$3.00 per year (although the thrifty farmer may escape this payment altogether). The consumption taxes on sugar, rice, and coffee may increase his annual tax costs by another dollar or two, providing he has to buy these commodities at market prices. The incidence of other taxes and sources of government revenues will affect him only indirectly. Another dollar or two would probably cover indirect taxation of this kind. Altogether, therefore, the average Dominican farmer, living close to a subsistence basis, will contribute, directly or indirectly, from \$6.00 to \$8.00 per year to the government.

Immigrant farmers actually will pay more. The tax contribution of the individual immigrant farmer, living close to a subsistence basis, may be \$8 or \$10 per year. For a small family, taxation will evidently cost about \$30 per year. The size of the tax bill of the successful farmer who expands into dairying, food processing, and similar agricultural industries will depend upon the nature and scope of his activities. An indication of the tax burden in these lines of endeavor has already been given. The tax burden in the dairying industries is not excessive.

⁷ Art. I of the contract. See p. 406.

The immigrant who, despite the cautionary phrases of the legislation which admitted him to the Republic, drifts into non-agricultural activities, will find his tax problem made much more difficult, for it is evident that the greater part of government revenues are obtained from manufacturing and commerce and from the urban population in general. The relatively high burden of taxation on business, and the record of constantly changing taxes on business and on goods consumed by the urban population, indicate that immigrants will find it difficult to compete with Dominicans in non-agricultural activities, even if permitted to do so.

IV. THE PUBLIC DEBT

Although the public debt has been a factor in shaping the political and economic destiny of the country, the subject bears little relation today to the specific problem of immigrant colonization, or to the problem of general economic welfare. Service of the debt, costing a little over \$1,000,000 yearly, is only about 9 per cent of approximately \$12,000,000 in government revenues collected in 1940. Few countries are able to devote so small a portion of their budget to this purpose.

The table on page 276 presents the gross value of bonds outstanding, and the current cost of debt service. The funded debt consists *only of foreign dollar "customs-guaranteed" bonds, held chiefly abroad.* There is no internal funded debt, and the floating debt and current claims against the government are believed to be small. An item in the amount of \$125,000 appears in the 1941 budget under the heading "Claims against the State, 1930-31" to permit compliance with one of the collateral undertakings of the Dominican government accompanying the signature, on September 25, 1940, of the agreement abrogating the Convention of December 27, 1924, between the United States and the Dominican Republic. Another budgetary appropriation in the amount of \$171,333 covers the balance due under a contract for the construction of the wharf and harbor at Ciudad Trujillo. Otherwise, there appear to be no important annual debts of a contractual nature.

As stated in Chapter IV, a convention signed February 7, 1907, between the United States and the Dominican Republic, provided

for the assistance of the United States in the collection and application of the customs revenues of the Dominican Republic. This convention was replaced by that of December 27, 1924. Under both of them, the customs revenues were pledged as security for foreign loans. The several bond issues floated after 1907 were for the following amounts (in thousands of dollars).⁸

Loan of	Total Issue, Par Value
1908	20,000
1912	1,500
1918	4,161
1922	6,700
1926	3,300
1926 (1st series)	5,000
1926 (2d series)	5,000

Of these seven issues, the first three have been retired or re-funded. Of the remaining issues, totaling \$20,000,000, bonds reported outstanding at December 31, 1941, as shown in the table below, totaled about \$14,430,000.

PUBLIC DEBT: OUTSTANDING BONDS AND BOND SERVICE, 1941
(In thousands of dollars)

Outstanding Loans	Bonds Issued	Bonds Retired	Bonds Reported Outstand- ing Decem- ber 31, 1941	Appropriations for Interest and Amor- tization, Calendar Year 1941 ^a
Loans of 1922-26, at 5½ per cent (issues of \$6,700,000 and \$3,300,000), originally due 1942, extended to 1961 . . .	10,000	3,000	6,950	559
Loans of 1922-26, at 5½ per cent (issues of \$5,000,000 each), originally due 1940, extended to 1969	10,000	2,520	7,480	540
Total	20,000	5,570	14,430	1,099

^a Law of Public Expenditures, 1941.

The total outstanding funded debt has varied little during the past 20 years. The nominal value of unredeemed bonds at the end of each year in the period from 1922 to 1930 was reported by the

⁸ Dominican Customs Receivership, *Report of the 23d Fiscal Period . . . 1929* (1930), p. 4.

Customs Receivership to have been as follows (in thousands of dollars):^o

Year Ended December 31	Nominal Value of Bonds Outstanding
1922	\$14,802
1923	14,178
1924	15,141
1925	13,790
1926	15,000
1927	15,000
1928	19,820
1929	19,684
1930	18,282

Full service of the public debt was continued throughout the early period of the Receivership. After 1929, however, the effects of the world depression, aggravated by the hurricane of 1930, reduced revenues at the very time when the loan contracts required a sharp increase in sinking fund payments. In this situation, the government suspended sinking fund payments, with the acquiescence of the government of the United States. Interest payments, however, were maintained. Amortization was resumed, though not at the full contractual rate, in accord with an agreement worked out with the Foreign Bondholders Protective Council, Inc., in 1934.

In 1941, by a treaty between the Dominican Republic and the United States, the Customs Receivership was abolished. The new agreement provides that all of the government's revenues shall be deposited in a local bank, and that no disbursement shall be made in any month until after the funds needed for debt service shall have been turned over to an American citizen appointed by the two governments to represent the interests of the bondholders. The local branch of The National City Bank of New York was made the depository. This branch, with the sub-branches in other cities, has recently been purchased by the Dominican government and is now a state institution.

^o Compiled from Annual Reports of the General Receiver for the years mentioned.

PART III

POSSIBILITIES OF REFUGEE SETTLEMENT IN
THE DOMINICAN REPUBLIC

CHAPTER XVII

THE SOSUA COLONY

In July 1938, in accord with a proposal by the President of the United States, representatives of 32 nations met at Evian, France, to consider the plight of the hundreds of thousands of persons who were being compelled to emigrate from central Europe for political or religious reasons. One of the major problems that confronted the conference was to find permanent homes for these refugees in other countries. It appeared in the course of the discussions that few of the governments represented were willing to commit themselves to accept any considerable number as immigrants. The one outstanding exception was the Dominican Republic, whose representative stated that his government was prepared to admit up to 100,000 persons for gradual settlement. This generous offer was one of the few concrete results of the conference.

Subsequently the Refugee Economic Corporation, in co-operation with the Advisory Committee on Political Refugees appointed by the President of the United States, undertook an investigation of the feasibility of settlement in the Dominican Republic. Funds for this investigation were furnished by the Refugee Economic Corporation. Alfred Houston, a lawyer experienced in Latin American affairs, made a preliminary visit to the Republic, and later three agriculturists chosen by President Isaiah Bowman of Johns Hopkins University made a more extended survey. This group—Henry D. Barker, crop specialist, William P. Kramer, forester, and A. E. Kocher, soil specialist—arrived at Ciudad Trujillo March 7, 1939 and left from there April 18, 1939. During two weeks of their stay they were aided by Dr. Pablo Morales Otero, specialist in tropical public health problems. The committee considered 17 different areas in the Dominican Republic which had been suggested as possibilities for refugee settlement. Their report summarized their observations on each of these areas and discussed the possibilities of success of a refugee colony, the establishment of work camps, etc. Six areas were recommended for settlement purposes and

one other was recommended with certain reservations. Another seemed to the committee to have limited possibilities.

After the committee's report, and after the outbreak of the war in Europe had excluded the possibility of settlement in other regions, such as British Guiana, which had also been under consideration, the "Agro-Joint" (the American Jewish Joint Agricultural Corporation, a subsidiary of the American Jewish Joint Distribution Committee) provided \$200,000 for the Dominican project. The Intergovernmental Committee, meeting at Washington in October, voted to support the project in every possible manner, and the Dominican Republic Settlement Association was formed with James N. Rosenberg as president and Dr. J. A. Rosen as vice-president.

I. THE CONTRACT WITH THE DOMINICAN REPUBLIC

In December 1939, Dr. Rosen spent about a month examining various tracts of land in the Dominican Republic for settlement purposes. On January 16, 1940, a delegation of the Dominican Settlement Association and other persons interested in the refugee problem arrived in the Republic. The group included Robert T. Pell, delegated by the State Department; Stephen V. C. Morris, secretary of the Intergovernmental Committee; Harold F. Linder, representing the Coordinating Foundation; and John Clancy, secretary of the Settlement Association. On January 30, 1940, at a ceremony attended by about 100 persons, a formal contract was signed by the Dominican Government and the Dominican Republic Settlement Association, in the presence of representatives of the Intergovernmental Committee on Political Refugees and the Coordinating Foundation, a corporation which had been set up under the presidency of Paul van Zeeland, formerly premier of Belgium, to act as a connecting link between the organizations working on refugee problems in all parts of the world. This agreement was ratified by the Dominican Congress in special session on February 21, 1940.¹

In this contract the Dominican Republic guaranteed

¹ The full text of the agreement is reproduced as App. D.

to the settlers and their descendants full opportunity to continue their lives and occupations free from molestation, discrimination or persecution, with full freedom of religion and religious ceremonies, with equality of opportunities and of civil, legal and economic rights, as well as all other rights inherent to human beings.

It promised the settlers every opportunity to "leave their present residences, to enter and reside in the Dominican Republic and to make their livelihood, establish their permanent homes and acquire citizenship in the Dominican Republic in accordance with its Constitution and laws."

Settlement was to progress gradually over a period of years, in order that the colonists might establish themselves as citizens of the Republic and reimburse the Association for its expenditures in their behalf. The Association was to select settlers in accordance with their fitness and technical ability for agriculture, industry, manufacture, and trades. Approximately 500 families were to be admitted as a first group, and this number was to be increased gradually up to 100,000 persons "in accordance with decision which in this respect shall be made jointly by the Republic and the Association." The Executive Power agreed to initiate laws freeing the settlers from all entry taxes and similar charges and permitting them to

bring with them, upon entering Dominican territory, free of duty and not for sale but for their own personal use in their agricultural enterprises and others incidental thereto, such furniture, personal effects, tools, equipment, materials and other instruments which they may need in order to establish themselves with economic solvency.

Such laws were subsequently enacted.

It was to be the duty of the Association "to take care of and promote the economic life of the immigrants" and to maintain an office or offices in the Republic. Its officers and employees were to receive every assistance in carrying out their duties, and it was to be free from taxes on transactions and activities connected with the transportation and establishment of the settlers "provided they do not imply competition with other similar activities open to private initiative." The Association was to supply funds for transporting the settlers and for maintaining them until they should

become self-supporting. It might acquire real estate and personal property, transfer them to the settlers, make regulations as to their economic activities, and in general have full rights "to deal with the settlers and with others, as it may see fit, in accordance with Dominican law." The rights of the settlers and the Association were not to be abrogated by subsequent legislation.

Article V provided that

the Republic shall by all the means in its power, except when of a monetary nature, facilitate the efforts of the Association for the selection, construction and maintenance of adequate living quarters and other buildings which will so far as feasible be built with material existing within Dominican territory, and shall cooperate with the Association insofar as feasible for the proper employment of settlers in agricultural enterprises, construction of highways and other similar activities. The Republic, likewise, shall take appropriate measures through the departments of its administration to help in the selection of suitable lands for agricultural purposes and for the acquisition of said lands by the Association, and shall give its best assistance to the Association for the purpose of giving or obtaining desirable options to the Association for agricultural lands which may be deemed adequate and necessary for future large settlement.

It promised to assist the Association in selecting and acquiring suitable lands and in acquiring valid titles thereto. Any rights granted in the future to other similar organizations were automatically to be extended to the Association.

II. THE SOSUA PROPERTY

Ten days before the signature of the contract, Generalissimo Rafael Trujillo offered to give the Association his large estate at Sosua, on the north coast of the Republic, in which he had personally invested not less than \$100,000. The Association accepted the property as the site of its first settlement, after prevailing upon the Generalissimo to accept stock in the corporation to the amount of its value.

The 26,000-acre tract known as Sosua, selected by the Dominican Republic Settlement Association as the site of its first colony, is situated on the north coast of the Republic some 15 miles east of the important town of Puerto Plata. It had previously been a banana

plantation, but for some reason production was abandoned in 1916. Exactly how much of the tract was originally in banana production is not known, but it is possible that the total reached several thousand acres.

From 1916 to 1939 part of the tract was utilized for grazing, and in 1939 there were reported to be some 5,000 acres of improved pasture. There were a number of miles of good fencing, 37 houses for laborers and supervisory force, two corrals, a pump house, a large water reservoir, and piping to the permanent buildings. The pastures were generally run down and in some cases were badly overgrown with guava bushes.

The tract embraces about 8 miles of seacoast and extends inland southward from the coast about $7\frac{1}{2}$ miles. Roughly, the northern third of the property consists of coastal terraces which vary in elevation from 20 to 200 feet. While rough in places and containing numerous outcrops of limestone rocks, this portion includes practically all the accessible plowable land. The southern two-thirds of the tract is rolling to rough and mountainous, and runs to elevations of at least 1,000 feet.

Sosua had not been one of the areas recommended for settlement purposes by the committee of experts which visited the Republic in 1939. The committee had reported that the tract was suitable for cattle and dairy production, but that the comparatively low rainfall, the shallow soils, the small areas of plowable land, and the scattered rock outcrops made it less suitable for general settlement purposes. It nevertheless seemed the most available site for the first settlement, not only because it could be obtained without spending any of the Settlement Association's limited capital, but also because the buildings and other improvements already on the property, and its accessibility, made immediate utilization possible.

It is difficult to estimate the total amount of plowable land on the property because of the irregularity of the terrain and because the plowable areas are composed of numerous small tracts. It seems likely that the total area of the plowable land on the terraces along the seacoast is not greater than 800 to 900 acres, and that there are not more than 200 to 300 acres in the interior. Small areas of fertile valley land are found in the central and southern portions,

but only crude wagon trails and horse paths over rough topography connect them with the outside.

III. THE SETTLERS AND THE ADMINISTRATION

After the ratification of the contract by the Dominican Congress and the Settlement Association, the Association at once took steps to select the first group of settlers and bring them from Europe. Six persons were established at Sosua in March and April, and the first large group—27 men, 10 women, and one child—arrived there on May 10, 1940. The next substantial contingent did not arrive until the end of September. In the months which have elapsed since then, additional arrivals have brought the total number of persons in the colony to 472.

Dr. J. A. Rosen, the vice-president of the Dominican Republic Settlement Association, was appointed by the Association as first director of the new colony. Dr. Rosen was a practical agriculturalist, whose experience in settling several thousand Jewish families on the land in South Russia under the auspices of the Agro-Joint seemed to make him particularly well qualified for the position. At first the resident staff, besides the director, consisted of an agriculturist, a clerk, and two physicians. On August 1, 1941, there were an agricultural supervisor, a herdsman, a construction engineer, a purchasing agent, an accountant, and two physicians. There have been a number of changes in staff personnel since the colony began. Dr. Rosen was compelled by ill health to give up the position of director, and was succeeded by Dr. David Schweizer, who had also had long experience in refugee work in Europe. The broad policies of the colony are determined by the director, but he frequently requests the advice of an elected council of settlers.

Between March 1940 and June 30, 1941 Sosua developed from nothing to a community of 352 men, women, and children living in a new environment, learning new tasks and slowly learning a new language. During this period six children were born, several divorces were granted, and a number of marriages took place, including two between male settlers and Dominican women. A settlers' organization was effected, a settlers' council was brought into

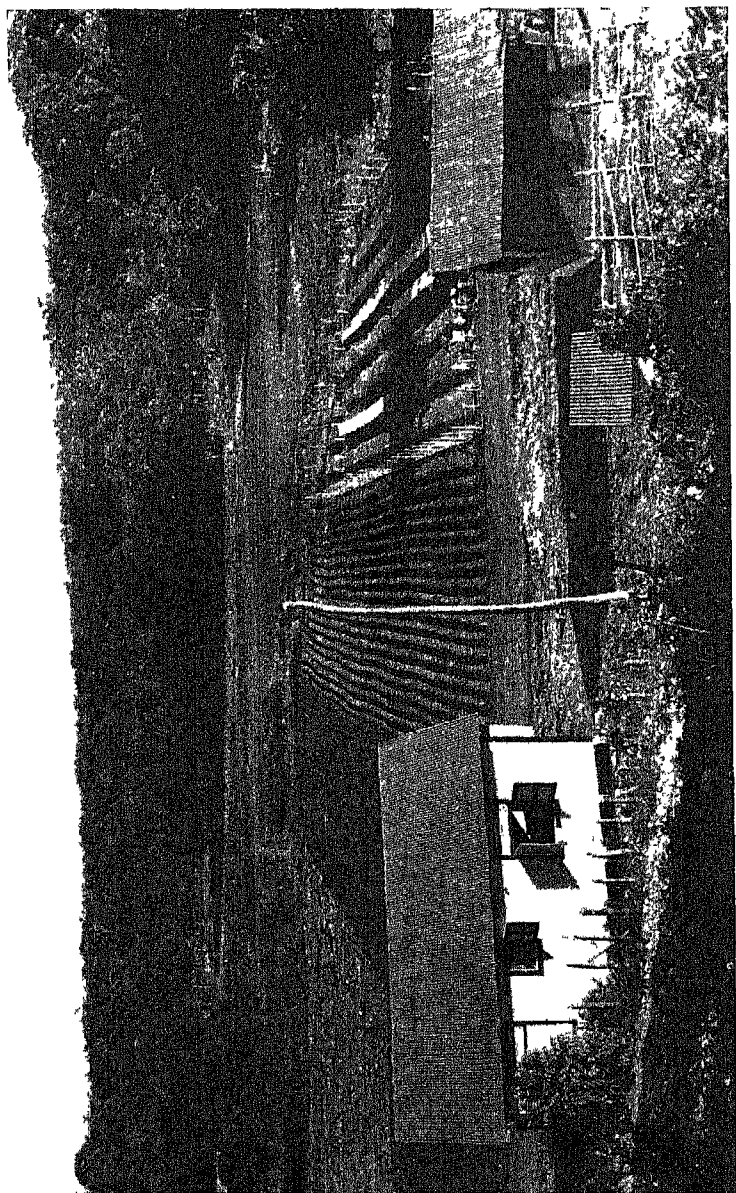
operation, recreational sports were organized, and Orthodox Jewish religious services were held regularly.

Out of the total of 352 settlers, 234 were men. They came from various walks of life and for the most part from Germany and Austria. The group was composed of some enthusiastic, hardworking individuals; others who were not industrious and not particularly enthusiastic but capable of getting along; and others who lacked ambition and had little desire to work. Unfortunately, the number in this latter group appeared to be in the neighborhood of 10 to 20 per cent of the total number of colonists. Only 13 of the colonists had previously been engaged in farming, although others had had some agricultural experience or training.

That this should be so is not surprising, in view of the circumstances under which the settlers were recruited. The persons whom the settlement sought to help were for the most part German and Austrian Jews, few of whom, of course, had been engaged in agriculture before the advent of the Nazi régime. An effort was made to choose persons who had some experience which would be useful or who seemed to have the qualities necessary for success in a new pursuit under a new environment, but it was exceedingly difficult, in dealing with persons who were desperately anxious to escape from refugee camps, to obtain truthful statements or to check the information received. On the whole, however, the quality of the human material seems as good as could reasonably have been expected.

The slow growth of the settlement has been a disappointment to those who hoped that the project might materially alleviate the plight of refugees in Europe. The task of selecting the colonists, obtaining the numerous visas required, and finding accommodations on ships was an extremely difficult and complicated one. Lack of transportation seems to have been the major obstacle. It may be said, however, that rapid growth in the initial stages of the colony might well have been disastrous to the whole undertaking, for the colony would have been in no position to handle a very large number of persons during the first year of its existence.

Settlers arriving at Sosua are supported by the Association during



SOSUA SETTLERS' HOUSES AND GARDEN^a

^a Foto Conrado

the period when they are being acclimated and given preliminary agricultural training. Thereafter they are established on homesteads in various parts of the property. Each family receives a house and two hectares (about five acres) of land, a horse or mule, two cows, and a small amount of other livestock and equipment. This homestead is expected to provide food, and in addition each family is expected to engage in some money-making enterprise, usually in cooperation with other members of the group settled in the same locality. These enterprises will be financed by the Association. Dairying, truck farming, castor bean production, and poultry raising are the chief pursuits elected by the groups thus far organized.

It is understood that the debt charged to the settler includes only \$1,600 represented by the cost of the homestead, including the amount advanced to each settler for the enterprise in which he elects to engage. The Association does not expect to recover the cost of transporting the settlers from Europe or the cost of their maintenance during the first year at Sosua.

In July 1941, the director communicated to the settlers the following statement of the arrangements which would be made for the benefit of those then at Sosua and of those who might arrive before the end of 1941:

The Dominican Republic Settlement Association—hereafter called Dorsa—is a non-sectarian, non-profit association which aims to help the settlers establish themselves in the Dominican Republic pursuant to an agreement between the Dominican government and Dorsa dated January 30, 1940. Dorsa confidently expects the settlers to cooperate with the Dominican government, to comply with its laws, to do their part to contribute to the development of the Dominican Republic, to comply with regulations which may from time to time be issued by Dorsa, and to cooperate with one another in the building of a wholesome community life.

The following arrangements outlined herein are for the benefit only of settlers now at Sosua or of those who arrive at Sosua before the end of this year.

I. Each settler receives maintenance for one year. This means food and lodging, necessary work-clothing, medical attention, agricultural training and Spanish instruction, plus \$3.00 per month in cash. This one year is divided into two periods of approximately six months each. Dorsa hopes that settlers will be ready before or by the end of the first six

months to go on their own homesteads. From that time until the end of the year, the homesteader receives a free credit at the Dorsa store or warehouse of \$9.00 a month, in lieu of the food and lodging theretofore received by him while living in the barracks. Dorsa and the settlers' Council decide when the individual is ready to go out on his own homestead.

Settlers' children at Sosua receive maintenance during the first year, which includes food, lodging and necessary clothing, medical attention and schooling. During that first year, the settler's family when established in its homestead will receive a free credit at the Dorsa store or warehouse of \$6.00 a month for each child between the age of 1 and 10, \$9.00 a month for each child above 10. During that first year mothers of infants under one year old will receive a credit of \$3.00 a month.

II. The family homestead will consist of the following:

A house on one hectare of land	\$ 800
One additional hectare of garden land	35
Furniture, fixtures and garden tools	120
Small livestock	25
One horse, one mule	45
One saddle	15
Two cows	45
Miscellaneous equipment	15
Credit per family for undertaking approved by Dorsa	500
Total	\$1,600

Dorsa will also be prepared to grant short term credits to individuals and their cooperatives on projects approved by Dorsa, and to aid settlers in finding domestic and foreign markets.

III. Settlers will receive formal agreements complying with Dominican law, as to their ownership of their homesteads. Such agreements shall contain appropriate provisions for the protection and development of a harmonious community life, and will deal with matters of detail in pursuance of this outline.

Settlers will not be required to pay any interest for two years. Thereafter interest at a maximum of 3% per annum will be charged and used for community purposes. The principal is to be gradually repaid over a period of years beginning in the third year. Appropriate documents will be prepared to be signed by Dorsa and settlers in conformity with this plan.

IV. AGRICULTURAL DEVELOPMENT

During the first six months, when there were only about 50 settlers at Sosua, activities included arranging and repairing houses, repairing roads, and bringing small areas of land adjacent to the

permanent houses into cultivation. Small plantings of vegetables, corn, papaya, bananas, and yuca were made. Coconuts were planted on a larger scale but in an area of heavy, sticky, black clay soil—an environment so unsuitable that the plants grew poorly and the project failed. Two field tracts were planted to bananas. One of these was in heavy soil in a small valley, and here the planting gradually died out. The other, on somewhat more desirable land, is still intact, but no appreciable yield of fruit has so far been harvested. This is due partly to two long periods of drought and partly to failure to clear away weeds and to protect the plants from stray cattle.

Apparently the surveys and reconnoitering of the first six months consisted of horseback trips into the hills and along the seacoast of the property. No accurate determination of the amount of plowable land available, no over-all drainage plans, and no general layout for a road system were made during this first period.

In December 1940, some of the settlers were moved to the first homesteads, but no definite areas were assigned nor were the boundaries of their subsistence gardens defined. These first settlers constructed wooden fences around small tracts of less than half an acre adjacent to their houses. In these gardens they planted beans, cabbage, tomatoes, potatoes, cucumbers, lettuce, and other vegetables. Several settlers produced good gardens, and in one or two instances they marketed considerable quantities of vegetables at the local store.

By January 1, 1941 between 40 and 50 acres, aside from the coconut and banana plantings previously referred to, were ready for planting, of which perhaps 20 acres were planted to vegetables and corn. Most of the field work up to this time was done by the settlers themselves. Their equipment then consisted of two tractors (a John-Deere Model B equipped with mounted plow, cultivator, and corn planter, and a Model D-4 caterpillar), a two-bottom disc plow, a five-bottom disc plow, and two disc harrows. There were some other small pieces of horse-drawn machinery.

Early in 1941 there was a marked increase in efforts to get land cleared and plowed and to construct more houses so that settlers could be moved out of the barracks to the homesteads. Three addi-

tional caterpillar tractors (one with a mounted bull-dozer), two "brush-breaker" plows, and other equipment were obtained. Some of this machinery was long in arriving owing to tardiness in ordering and delays in transit and delivery, and unquestionably the agricultural program was thereby retarded.

The land clearing operations consisted, in most cases, of clearing guava bushes, although other larger tree species were found on some areas. The method of procedure varied somewhat, but usually consisted of cutting out the larger bushes with machetes, pushing over the remaining bushes with the "bull-dozer," and bringing them together in piles which, when partially dried, were burned. Then the field was plowed with a "brush-breaker." Plowing of grassy areas free from bushes was usually done with disc plows. Generally the plows were first set to cut 1 to 2 inches in depth. After all the area was plowed to this depth, the entire area was replowed with the same plow to a depth of 2 to 3 inches, which in turn was followed by a plowing 4 to 5 inches in depth. In each of these land preparation operations, it seems that the cost of operation could have been considerably reduced by utilizing machinery to its fullest ability and thereby cutting down on the number of operations.

From January 1 to July 1, 1941, some 250 acres were prepared for planting. Of this acreage, about 180 had formerly been grassland or had been covered with guava bushes. By July 1, about 80 of the 250 acres were planted to vegetables or corn. In one instance a field of some 50 acres was plowed before January 1, and was prepared for planting three times, but up to July 1 most of this tract was still unplanted.

Although most of the agricultural operations before January 1, 1941 were carried out by the settlers, a large part of the work after that date was done by hired Dominican labor. This was true especially of such work as cutting down trees, collecting and burning brush, erecting fences, clearing pastures, and practically all work involving the use of oxen. In addition, one or two tractor drivers were Dominicans. Farm operations were much hindered by lack of skill and experience on the part of the settlers. Frequently, mechanical equipment was used under improper adjustment, and

sometimes improperly matched power and tillage units were used. Such deficiencies in operation were due in some cases to lack of proper equipment or lack of sufficient skilled supervision.

During the period from January to July 1941, approximately 200 cows were milked daily, the work being done by settlers or Dominican laborers. The milk was sold to Dorsa or to Dominicans through the local store. A goodly number of calves were born during this period but many died. The exact cause of these deaths was not learned.

The agricultural field program was divided roughly into three phases: preparation of available land, training of settlers, and exploration and development of new areas. During the first part of the settlement's history, the first task was to train the settlers, and the small areas near the central group of buildings were prepared and planted in the training work. However, as the number of settlers increased, and as the available land areas were enlarged and more attention given to the development of new areas, the agricultural supervisory staff was not materially expanded. As the operating units became more scattered, much more time was spent by the settlers in traveling to the places of work, and great difficulties were experienced by the staff in keeping in touch with the far-flung operations.

Extensive observations in the field indicate that the settlers did not receive adequate field instruction or demonstration. It would seem that careful instruction, carried out by explaining the various fields of activities, proper demonstration, and practical lessons under the eyes of competent instructors with sufficient time and enthusiasm to devote to the work are essential.

V. BUILDINGS AND CONSTRUCTION

At the time the Settlement Association took over the Sosua property there were a number of permanent buildings, including a large house that had apparently been used as a dwelling, several smaller dwellings, an office, a small store, a machine shed, and a milking barn. Most of these buildings needed some repairs but were in usable condition. The large dwelling has been remodeled into an office building for use by the supervisory staff. Besides this,

several warehouses, an engineering office, a woodworking shop, and several other buildings have been constructed. The smaller dwellings on the property were used to house some of the early arrivals and some of the supervisory staff. Because of a sudden large influx of settlers, a number of barracks were built late in 1940 and 1941. These are used to house the settlers during their training period while they are being prepared for life on the homestead. One of these barracks contains a community hall or theater for use by the settlers as a meeting place.

The construction of homesteads for the settlers started in 1940 and is being continued. Except in a few instances, the houses are being built by Dominican labor, the settlers' time being used in a training program to fit them for an earlier self-sustaining life on the land. A rather uniform house design was used to facilitate construction and to reduce supervision. In general the houses are of frame construction, native pine lumber with galvanized sheet-iron roofs being used. The houses are set on concrete piers. They contain two rooms, a kitchen, a bath, and a porch. No termite protection is built in, and no screens are provided. The cost of construction of these houses is \$740.

In a few cases settlers have decided to build their own houses, thus reducing the initial charge against them and obtaining a house in which they have more personal interest. Several other groups are constructing their own auxiliary buildings, such as livestock and implement shelters. Many of these buildings are constructed of native materials.

VI. WATER SUPPLY AND SANITATION

The Association found on the property a 50,000-gallon reservoir, located on the side of a hill, from which water was piped to the permanent buildings. The water is pumped to the reservoir from a small stream on an adjacent property. The pump intake is on the downstream side of a bridge on the public road to the settlement. The stream flows through a well-inhabited area, and thus presumably carries all the pollution to be expected from a tropical river used as a laundry and as a bath for man and beast. No attempt is made at purification, but the settlers are told to boil all drinking water.

Owing to the increased demand at the central buildings, most of the piping has been replaced by new and larger pipe. At present the pressure is very low, and homesteads on higher ground receive water only late at night when the demand at the central buildings ceases. Several wells, some deep and some shallow, were found at various places on the property. Three of these were equipped with pumps, one hand-operated, one windmill-powered, and one powered by a hot-air engine, to supply the watering tanks for the livestock. Several other wells have now been equipped with pumps and some new wells have been drilled.

The entire Sosua property is underlain with a porous limestone. Water seeping through the soil flows through this rock on its way to the sea. That this flow is quite free is indicated by the fact that even during a rainy season the water in several wells a few miles from the coast is practically at sea level. Because of the porosity of the rock and its frequent surface outcroppings, there is danger of surface pollution in all these wells.

Health conditions, however, have thus far been good. Forty cases of malaria were reported up to July 1, 1941, of which three were chronic, but there had been no cases of dysentery or typhoid fever. The principal maladies contracted after arrival at the settlement have been gastro-intestinal troubles and abscesses, with a few cases of angina, influenza, and skin diseases. The clinic maintained by the Association has treated some 40 cases daily, but many of these have been native Dominicans and the majority have involved minor ailments, small wounds, or local infections.

VII. EXPENDITURES

The following table gives a preliminary rough estimate of the expenditures of the Association up to July 1, 1941:

Construction	\$125,000
Farm operations, fences, land and road improvement, road building	40,000
Loans to settlers	16,000
Livestock	20,000
Farm implements	30,000
Tools and equipment (furniture, kitchen fixtures, etc.)	39,000
Material and supplies in stock and in transit	66,000
Electric distribution system (\$11,000 of the total \$15,000 represents a deposit)	15,000

Maintenance of settlers and trainees	36,000
Cost of selection of settlers, their transportation and maintenance in the Dominican Republic, and incidentals	15,000
Medical aid, recreation, cultural activities, education	18,000
Dominican Republic administration and organization expenses	54,000
New York administration and organization, including research and other expenses	63,000
	\$537,000

These figures do not include approximately \$111,000 spent in bringing settlers to the Dominican Republic, most of which has been provided by other organizations interested in the refugee problem.

It should be noted that these figures include \$71,500 paid out in wages to Dominican laborers.

VIII. NUMBER OF SETTLERS TODAY

The settler population at Sosua on June 30, 1942, according to figures furnished by the Settlement Association, was 472. There were 104 married couples, 158 single men, 38 single women, and 68 children under 15. Eighty-one "units" of settlers, including 38 married couples, 44 single men, and one single woman, were either on homesteads or about to go on homesteads which were being completed. Including children, the total number in these first units was 143. Fifty-one additional units comprising 72 persons were reported ready to go on homesteads, presumably when the latter were available; and 38 units comprising 66 persons were preparing to go on homesteads. Other groups were: 41 settlers in a more doubtful status; 44 persons classified as semi-settlers, artisans, mechanics, chauffeurs, etc.; 13 "settler employes"; 20 trainees; 55 "settler relatives"; and a few engaged, divorced, or widowed women, non-settlers, and so forth.

CHAPTER XVIII

AN AGRICULTURAL PROGRAM FOR SOSUA

When all the factors involved are considered, it becomes apparent that, if the Sosua venture is to succeed, it must be primarily an agricultural success. The Dominican economy as a whole is predominantly agricultural, and the manufacturing which exists is largely based on agricultural products. Scarcity of fuel and mineral raw materials places limitations on industrial development. Although it may be possible to develop some industrial sources of income, it will not be easy, and the prospect is at best obscure.¹ The settlers must look to the soil for most of their livelihood.

The brief discussion of farming operations in the early stages of the colony, which has been presented in Chapter XVII indicates the lack of experience which, at least temporarily, must prove a handicap. Not only was there a dearth of persons who had worked on farms, but there was a general absence of mechanical training and skills which are needed in a self-contained community. Furthermore, the Sosua tract, while having certain immediate advantages, was not chosen primarily because of its suitability for general agriculture. These factors serve to emphasize the need for an agricultural program designed to fit the situation which actually exists. Such a program is presented in this chapter.² It is not intended to be definitive or final, but to suggest a path that may be pursued advantageously while the solid lessons of experience are being learned.

The general agricultural program should include production of sufficient subsistence crops to care for the major needs of the settlement, as well as certain cash crops. Prudence would suggest that the latter be started in a small way because of the inexperience

¹ See App. C for a discussion of industrial possibilities.

² Some of the crops recommended here are also discussed in Chap. 8, wherein the possibilities of increasing agricultural production in the Republic as a whole are surveyed. Differences in temperature, rainfall, and soil among the various sections of the country, and the special problems of the Sosua settlers, made it impracticable to combine the two discussions.

of the settlers, the small amount of arable land available, and unsettled world conditions which may radically change the external market outlook overnight. Along with these crops, some poultry raising, pork production, and cheese and dairy production appear to be feasible. It must be remembered that the local market is small, and that shipment to other points in the Republic is expensive and sometimes difficult.

I. FOODS FOR HOME USE

The settler must produce as much of his own food as is reasonably possible. His production, in variety and quantity, must be sufficient for an adequate diet and planned so as to keep his table constantly supplied. In general, home production should provide all the settler's own food except grains and some meats. It is assumed that a typical homestead will consist of one hectare (2.47 acres) of rough to rocky ground and an additional hectare of arable garden soil. By careful planning and diligent work, this may be expected to provide a continuous supply of fruits and vegetables. The settler will find it worth while to develop a taste for products which are grown easily in the tropics.

Fruits and vegetables. Subsistence crops will include fruits and other permanent plants, long-period crops, and crops requiring a shorter growing season. Of the last group, some will be needed only in quantities requiring small plots, while others will require larger areas. The actual quantities planted will of course depend on the size of the family and on individual tastes.

The permanent crops, largely fruit trees, should be planted on the rough land around the house, as they require little cultivation and will provide shade. From one to three orange trees, one or two grapefruit, a breadfruit, one or two avocados, a mango, a cashew or two, and three or four coconuts will add variety and considerable food value to the diet. Besides these, a half-dozen each of papayas, bananas, and plantains, as well as a row of pineapples, will help to make this rough land of permanent value.

Of the crops requiring regular cultivation, sweet potatoes, yams, yuca, yautias, gandules, and chayote need rather long growing periods. The first four of these are root crops used in place of

or as substitutes for the Irish potato. When well prepared they are an excellent addition to the diet, especially during the summer months when Irish potatoes do not thrive. These crops grow the year around and can be harvested as needed, so that a goodly supply should always be available. Because of their long growing periods, they should be planted where they will interfere least with the cultivation of the remainder of the field.

The remaining vegetables, all with rather short growing seasons, may be divided into groups. Some, such as Irish potatoes, onions, beets, spinach, kale, leaf lettuce, and cabbage, produce only one crop per planting, but the plants remain in good condition for harvesting during a considerable period after maturity. It should be emphasized that Irish potatoes are out of their natural environment in the sea-level tropics. Careful attention to seasonal factors is required, as they produce well only in the winter. Most of the other crops in this group can be produced the year around by watering during dry weather. The quantity to plant at one time and the interval between plantings to provide continuous production must be determined by experience for each family.

A second group of plants, including tomatoes, beans, cucumbers, calabashes, chick peas, and eggplants produce a continuous crop over a period of time. Here again, experience will tell the number of plants required and the time interval between plantings.

Tropical sweet corn will be found a valuable addition to the diet. A small rectangular plot planted each month will produce almost a continuous supply. No field corn should be planted nearby, as corn varieties cross-pollenate readily.

The primary purpose of this home garden is to provide food for the family. It should be near the house so that the spare time of all members of the family can be readily utilized. While the garden should not be so large as to become the major occupation of the settler, it may be expected to provide an adequate supply of food in both quantity and variety. Small quantities of excess vegetables can be sold or traded for other products. In general it is suggested that one-fourth acre, or about one-tenth hectare, be used for sweet corn, for potatoes during the winter months, and for grass to feed a cow or horse.

It is difficult in the tropics to maintain enough humus in the soil to assure fertility and good tilth. As an aid in this direction, the area not used as a vegetable garden may be planted to leguminous cover crops and grasses such as elephant, guinea, or molasses, which can be used to feed the family cow or horse. A regular process of crop rotation should be carried on between this grass area and the garden. A compost heap, in which all leaves and other plant materials are incorporated with such animal manure as may be available, to be turned into the soil at regular intervals, will aid further in maintaining the humus content.

Recommended vegetable varieties. A list of vegetable varieties recommended for this climate by Wallace Bailey, of the Puerto Rico Experiment Station of the United States Department of Agriculture, follows:

Beans, lima	Chinese Cabbage
Early Leviathan, large-seeded pole	Pe-Tsai
King of the Garden, large-seeded pole	Chihli
Carolina or Sieva, small-seeded pole	Corn, sweet
Henderson, small-seeded bush	USDA-34
Beans, snap	Cowpeas
Stringless Green Pod, bush	Brabham
Bountiful, bush	Sugar Crowder
Stringless Black Valentine, bush	Black Eye
Rust Resistant Kentucky Wonder, pole	Cucumbers
Beets	Black Diamond
Detroit Dark Red	Mildew-resistant variety developed by Agricultural Experiment Station, University of Puerto Rico, Rio Piedras
Crosby's Egyptian	
Early Eclipse	Eggplant
Broccoli, Italian or sprouting	University Pink (Experiment Station, University of Puerto Rico)
Calabrese	Black Beauty
Propageno	Fort Meyers Market
Cabbage	Gandules
Golden Acre	Varietal names unknown
Early Jersey Wakefield	
Cantaloupes	Kohl-rabi
Hales Best	Early White Vienna
Carrots	Lettuce
Danvers Half Long	Grand Rapids
Chantenay or Model	Black-seeded Simpson
Red-Cored Chantenay	Mignonette
Oxheart	Paris White Cos

Okra	Squash— <i>cont.</i>
Dwarf Green Prolific	Early Summer Crookneck
White Velvet	Swiss chard
Mammoth Long Pod	Lucullus
Onions	Fordhook Giant
Yellow Bermuda	Tomatoes
Peppers	Marglobe
California Wonder	Turnips
Ruby King	Purple-Top White Globe
World Beater	Japanese Foliage or Shogoin
Potatoes, sweet	Watermelons
Puerto Rico	Dixie Queen
Mameyita	Kleckley Sweet
Key West	Stone Mountain
Radish	Yams
Any early or extra-early variety	Guinea
Squash, summer	Morado
Early White Bush	

For maximum yields, all vegetables listed should be irrigated during periods of drought. Gandules, yams, cowpeas, okra, carrots, sweet potatoes, Henderson lima beans, sweet corn, and to a lesser extent tomatoes, peppers, and eggplant, can stand short periods of drought without severe injury, but usually not without reduction in yield.

Milk supply. Divergent views are held as to the most feasible method of providing milk for the colony. According to one view, all dairying activities should be centralized in a single plant, with efficient modern equipment, and operated as any commercial dairy although it might be co-operatively owned. The view held by most members of the survey staff, however, is that production by such methods might be too costly. Instead, as a general practice, each family should care for its own cow, the labor of various members of the family being utilized.⁸ With two cows, lactation periods could be staggered so as to provide a continuous milk supply.

The difference of opinion as to dairying methods arises primarily

⁸ I dissent from this view. In agriculture, as in industry, mass production lowers costs and lessens expenditure of labor. Much better sanitation and higher production, as well as greater economy, can be obtained by the combined efforts of the settlers through co-operatives than by their individual efforts, particularly in dairying. The settlers should be of a character to appreciate readily the value of co-operative effort.

from a difference in conception of the type of economy which is possible for the Sosua settlers. Members of the staff who believe dairying should be conducted on a simple basis, without substantial expenditure for equipment, agree that if the settlers were able to establish themselves permanently as producers of profitable money crops they might find centralized operations more satisfactory. But prospects for money crops, as is stated elsewhere, appear relatively meager, and the settler must supply far more of his living direct from his own soil than is the case with farmers in more favorable situations. This does not imply that he cannot have a satisfying, healthful existence. It does mean, however, that it may be advantageous for the settler to utilize methods which require a minimum of capital investment even though they might not be considered most efficient under other circumstances.

Poultry. The prevalence of diseases and parasitic organisms in the tropics makes it necessary to keep poultry on elevated wire mesh if satisfactory results are to be obtained with good breeds of chickens. Equipment for such production is relatively expensive, and the cost of feed is high. It is believed that, except for those who make poultry production their business, each settler's home flock should be small. It should be kept in the shade near the house and tended as a spare-time job.

II. POSSIBLE MONEY CROPS

A discussion of new crops or of ways and means of crop improvement for a community is at best a presentation of what seem to be possibilities. Only experience will demonstrate what can actually be accomplished. It is especially difficult to suggest crops which might provide a cash income for the settlers at Sosua. They are confronted by the fact that the local market is scattered and has but small purchasing power. Settlers will be handicapped by inexperience and the lack of a large amount of arable land. On the other hand, they will presumably have useful practical advice from the colony's new agricultural staff, and they will have some capital. It should be possible for them to find means of earning money beyond a bare subsistence, and it is of course essential that they should do so if the colony is to succeed.

The Settlement Association, as indicated in the preceding chapter, plans to advance to each settler family \$500 for some undertaking by which a cash income can be obtained. In most cases this will involve an agricultural venture, either by a single settler or by a group working co-operatively. Several individuals or groups are already attempting dairying, truck-farming, castor bean production, and poultry raising. Thus far the Settlement Association itself has furnished a market for much of the settlers' produce because it has been providing food for the community at its own expense. This situation cannot continue indefinitely, of course, and it will be necessary to consider what products the settlers can grow for sale in the restricted local market or for export.

Of the activities now being carried on, dairying, truck-farming, and poultry raising should be encouraged, because they will help to make the colony self-sufficient so far as food is concerned; but it may be doubted whether they can permanently provide a cash income for any large number of settlers. Some milk, fresh vegetables, and eggs can be sold locally, but the amount will be limited by the smallness of the market and the lack of transportation facilities. Some of these products might be exported to Puerto Rico or the United States. Before undertaking the cultivation of winter vegetables or other products on a scale sufficient to make export worth while, it would be necessary to consider carefully the state of the market, the availability of steamer service, and the effect of tariff or sanitary restrictions—factors which are constantly changing under present conditions.

As an example of crops which might possibly be grown for sale in small amounts in the Dominican market, tropical sweet corn might be mentioned. Other possibilities will no doubt appear as the result of experience. When a sufficient milk supply becomes available, a small amount of cheese can doubtless be sold locally or even exported, but this will depend upon the ability of the settlers to produce a superior product. Plantains might perhaps be exported to nearby islands if transportation were available. The great advantage of devoting attention to products such as those mentioned is that they can be produced as a part of the colony's subsistence program, and any attempt to develop them as money

crops, on a small scale and experimentally, will involve no serious risk. The same thing is true of poultry raising and pork production, and perhaps of the raising of spices on a small scale, primarily for home use.

It seems unlikely, however, that such products will meet entirely the need of the colony for a money income. Several other possible cash crops are therefore considered below.

Castor beans. As long as the price for castor beans remains above 1 cent per pound in the Dominican Republic it would seem that castor bean production might be a paying proposition. It is reported that the production of a ton per acre of beans annually might be expected. One man should be able to plant, cultivate, and harvest 7 acres, on a part-time basis. On a 1-cent per pound basis, this would mean a return of \$140 for his part-time labor and for rent of the land. No special equipment other than a hard-floor drying pen is necessary for castor bean production, and this is not expensive to build.

In planting castor beans the spacing depends upon the variety and upon the soil. Spacings range from 5 by 5 feet to 6 by 8 feet. Four seeds are usually planted per hill and a germination of 60 to 80 per cent may be expected. When the young plants are 8 to 12 inches high, the stand is thinned to two plants per hill. When the plants reach 2 to 3 feet the weaker is cut out, assuring a nearly perfect stand. Six or seven pounds of beans are required to plant an acre. At the end of six months, if conditions have been at all favorable, the first harvest may be made and a quick income is provided with a minimum outlay.

Lemon-grass oil. More than 250 tons of this commodity are imported into the United States annually, chiefly from the East Indies. Trial plantings have shown that the grass will grow satisfactorily at Sosua, and considerable attention was given to its possibilities. The conclusion was reached that, under normal world conditions, with the oil bringing a price of somewhere around 50 cents a pound in New York, it would be impossible to compete with the cheap labor of the Orient. With East Indian shipments cut off by the war the price has risen sharply, reaching approximately \$4.00 a pound in

May 1942.⁴ If a satisfactory sales contract could be negotiated at about this figure, of sufficient duration to permit amortization of distilling equipment, experimentation with this product would be warranted.⁵ Possibilities of successful production are affected by many factors, such as suitability of the land, cost of fuel and labor, availability of water, degree of mechanization, and the organization of the local plant. A discussion of these factors is presented as Appendix B.

Citronella-grass oil. Citronella and lemon grass yield in general similar weights of grass per unit area. Cutting and distillation operations are identical. Since the yield of citronella oil per unit of grass is about twice that for lemon-grass oil and since roughly the value of the oil is about half, general conclusions reached concerning lemon-grass oil will apply to production of citronella oil.

⁴ In 1935, the price ranged from 60 to 95 cents; in 1937, from 42 to 55 cents; and in 1939 from 32 to 85 cents. On Jan. 6, 1941, it was 76 to 80 cents; on June 30, \$1.90; on Dec. 29, \$3.00. By May 25, 1942 it had reached \$4.00 to \$4.25.

From issues of *Oil, Paint and Drug Reporter*.

⁵ I believe that lemon-grass and citronella oils could be produced profitably by the Sosua colonists even at the prices which have usually prevailed in peacetime.

Production of lemon-grass and citronella oils in far Eastern countries has had the benefit of little or no research. It is an industry lending itself well to large-scale methods and mechanization, with correspondingly lowered costs. The results of much research by the United States Department of Agriculture in Puerto Rico are available to the Sosua settlers. In Florida, with much higher wage scales, the industry has been mechanized and is operating profitably. The uses of lemon-grass and citronella oils, especially the latter, are increasing, with correspondingly greater demand and prospects of better prices, irrespective of war conditions.

The viewpoint of my associates regarding competition with the cheap labor of the Orient is appreciated, but it should be pointed out that the mass production of the Dominican Republic in sugar has permitted competition with labor at 11 cents (U.S.) per day in Java. The production of these essential oils affords better opportunity for the application of technical knowledge than most other crops.

The attitude implied by admitting the inability to compete in the production of these oils leaves little encouragement for any agricultural enterprise in the Republic, a country which to me appears to have many agricultural advantages. This industry, in which technical developments have been substantial, was first suggested because it appeared to offer a better opportunity for the settlers to capitalize on their education than other crops requiring physical effort only.

The difference in viewpoints between myself and other members of the staff goes somewhat deeper than the immediate issue and applies at certain other places in the report. It is my opinion that the profit possibilities of surplus subsistence commodities and cash crops over a period of years, with alert direction, have been under-estimated.

Papayas. This fruit, in our opinion, merits special attention.⁶ Papayas grow well in the Sosua area and would be a good crop on some of the hillsides. The fruit should be lightly scratched or cut with a small sharp object early in the morning and the latex caught in a glass or similar receptacle. The latex should be spread out in the shade where it is exposed to gentle winds, and dried to the consistency of a paste. Low artificial heat may be necessary in cloudy weather. The dried latex or gum must be kept in air-tight containers.

Each fruit may be tapped as much as every day per week as long as it yields latex, and the tapping may continue throughout the year. The possibility of obtaining latex from young papaya plants by wounding the stem might be tried.

Coconuts. Coconuts should be planted at once along the seashore of the Sosua tract. The potential value of this crop is discussed in Chapter VIII.

Vanilla. Vanilla, which must be planted from cuttings, takes about three or four years to get into production. Shade and support for the vines are required. It can be planted on fairly steep slopes, and would thus be useful in sections where erosion should be controlled, and in sections where no other suitable crop would bring in as high cash returns. The flowers must be pollinated by hand, and some skill and experience are required for this as well as for killing and curing the bean. The crop has a high value per acre. Current prices are unusually high, but even at normal prices a good income might be obtained over a period of years if production could be maintained. Vanilla is now grown in Puerto Rico and Mexico, but it should be pointed out that the Puerto Rican product pays no United States tariff and Mexican production utilizes cheaper labor than is available in the Dominican Republic.

Divi-divi. Divi-divi is a leguminous tree well adapted to semi-arid climates, and experimental seeding might be conducted to advantage on hillside land. It might not only produce some income from land that is now idle, but also provide forest cover to reduce erosion. A small amount of this product is now obtained in the

⁶ See also discussion on p. 156.

Republic, both for use in local tanning establishments and for export.

Cashews. These trees grow well in the interior of the Sosua property, and their production should be encouraged on land that is useless for other purposes. Some means of extracting the oil from the shell and a cheap method of obtaining the whole nut would be valuable discoveries.

Various specialty crops. In the sheltered interior valleys, sesame, grown for the oil in the seeds, spices and drugs such as belladonna, pepper, geraniums, sunflower, and lavender, might be grown. These require experimentation to demonstrate their value, and will not furnish an immediate income.

Rubber. While the prospects for profitable commercial rubber production in the Dominican Republic do not seem bright, the rubber tree would be useful as a means of maintaining a ground cover on the hillsides. Generally speaking, rainfall is inadequate, but trees planted primarily for this purpose might conceivably provide some cash if tapped at times when prices were abnormally high. It is suggested that a small stock of plants be obtained for experimental purposes. There are now in the Dominican Republic about 5 acres of healthy, 10-year old rubber trees (*Hevea brasiliensis* *rojo*) grown from seeds obtained near Matto Grasso, and also several thousand young seedlings ready to be transplanted. The planting, owned by the Goodrich Rubber Company, is near Piedra Blanca on the Carretera Duarte, in a region of heavier rainfall than at Sosua. Tests made on these trees indicate that the quantity and quality of the latex compare favorably with that produced in other well-known rubber-producing areas.

Tree crops and precious woods. For the purpose of utilizing the rocky and hilly lands on the Sosua property, it is suggested that consideration be given to the planting of various tree crops and precious woods. Tree crops include such species as ylang-ylang for essential oil production, tung for tung oil production, rubber (mentioned above), oil palm (*Elaeis guineensis*) for edible and semi-edible oil production, kapok for vegetable wool, the kudzu vine for forage and edible roots, and date palm for fruit. Precious woods

include mahogany, satinwood, Spanish cedar, roble, and *capá*.

The planting of the hilly and rocky sections of the property should be done gradually for the sake of economy. A number of the above-mentioned species occur on the property in small quantities, and it is understood that in earlier years some cutting of precious woods was carried out on the property. Replacing the low-value or useless species now prevalent could be done by gradually clearing out the present stand, replanting the slopes and rocky areas with the desired species, and utilizing the small areas of level land for subsistence gardens for the settlers working on the tree crops.

CHAPTER XIX

THE CAPACITY OF THE DOMINICAN REPUBLIC TO ABSORB REFUGEES

To accomplish its purpose the enterprise of refugee colonization must essentially be adapted to environmental conditions in the area of operation. Preceding chapters have dealt with the general nature of problems confronting mass resettlement of the distressed and impoverished refugees of Europe. The major elements of Dominican economy have been described in some detail, as well as the climate, demography, land resources, soils, crops, and the agricultural and industrial potentialities. In this chapter an attempt is made to apply the findings directly to the basic purpose of determining the prospects and potential scope of organized colonization within the Republic, the economics of refugee settlement there, and the ensuing nature of a settler economy.

Any analysis or description of settler economy must essentially be prefaced by a clear understanding of just what is meant by settlement. Settlement, as it applies to the tropics, has been defined by Price as "permanent colonization, under which the incomers and their descendants follow all the usual routine of life, including manual labor, maintain their standards of health, energy, civilization, and culture, and raise families that do not exhibit mental or physical degeneracy."¹ This clearly implies a healthy, enduring community, supported by its own efforts and labor.

Although Price was discussing permanent settlement in the tropics of selected white migrants, it must be assumed that the basic aims and means of attainment in both migrant and refugee settlement are identical. Despite greater cost of the latter due to refugee impoverishment, and greater risk due to the difficulty of proper selection, the economy of refugee settlement must rest fundamentally upon ultimate self-support. The refugee movement will have some initial need for subsidy, and the temptation to continue subsidy will undoubtedly be strong. But permanent white colonization

¹ A. Grenfell Price, *White Settlers in the Tropics* (1939), pp. 3-4.

cannot be based upon the idea of continuing subsidy, for obviously there is no means of measuring the ability, capacity, or will of any financing agent—public or private—to subscribe an indefinite amount in perpetuity for the direct support of an entire community.

The term "refugee settlement" will, therefore, be construed to mean the establishment of an enduring self-supporting community. Furthermore, owing to the nature of the operation and the pressures behind it, it will be construed as settlement of the largest number of people consistent with the possibilities of self-support and ultimate betterment. The purpose here is to describe the means and limitations of such refugee colonization in the Dominican Republic.

The economics of refugee settlement are almost wholly determined by circumstance. Neither the settlement agency nor the settler has much choice in the matter, and the penalty for ignoring the prescribed course is severe. Almost the sole resource of the Dominican Republic is land, and the only practical means there of lifting a substantial number of people from a state of total dependence to a reasonable degree of self-support within the time and financial limits imposed is agriculture. Moreover, refugee dependence, on the one hand, and limited finances for his settlement and support, on the other, dictate prompt and effective organization of a subsistence form of agriculture if available financial resources are to cover the largest possible number of settlers. This is especially true of foodstuffs in a country where the native food supply is deficient and where an added demand only serves to accentuate the shortage. Finally, there are a variety of circumstances which prescribe the organization of settlement on a community basis as the most practical means of creating, protecting, and maintaining a reasonably satisfactory standard of living. Initially, at least, refugee economy rests upon a subsistence form of agriculture designed primarily for the maintenance and support of the refugee colony itself.

I. INDEPENDENCE IN FOODSTUFFS

In one sense, subsistence is an unfortunate term, for it has acquired the connotation of scarcity, want, and a low level of existence. In a machine age of chain stores, dated and branded products,

cellophane distribution, and installment buying, the idea that man of his own direct effort can produce a substantial part of his needs meets with a good deal of skepticism. That highly self-contained communities on a comfortable scale of living have been developed in the past—and without modern tools of production—is generally forgotten by all except those close to the soil, and too many of the latter are tending to forget it. Popular impressions to the contrary, subsistence farming is still what competence, energy, ingenuity, and initiative make it.

The refugee settler in the tropics, aided by capital, modern equipment, and expert advice, and established in an organized community, can go a long way toward supplying himself and his family with the essentials of life and a reasonable degree of comfort. While both of these terms are relative, the comparison is not with the so-called American standard of living, but with the previous condition of the refugee, particularly the circumstances of his immediate past, and with native standards in the country of settlement. With full allowance for his initial ignorance of agriculture, it will require relatively little effort or ingenuity to better the condition he left behind in Europe. Settlement in the tropics has many drawbacks, but it also has many advantages from the standpoint of subsistence farming. Properly handled, the land will produce something the year around; clothing requirements are minimum; and, economically, life is simple.

Chapter XVIII outlines in some detail a garden crop schedule that would make the settler virtually independent in foodstuffs. Total independence will come only with the abandonment of northern European dietary habits and the adoption of a tropical diet which, in addition, the settler will find more conducive to the maintenance of good health.

From the economic standpoint, early independence in foodstuffs is the most vital task of settlement for settler and settlement agency alike. It is the simplest and most practical means of reducing the debt of the former and the costs of the latter, two of the most critical factors in the whole problem of permanent refugee colonization. In the Caribbean, particularly, early independence in foodstuffs is essential if the refugee settler is not to encroach upon an already defi-

cient native food supply. Until independence has been attained, diversion of land or effort to other purposes is unwarranted. Basically, European emigration stems from the fact that Europe cannot advantageously exchange the products of labor for food. Deliberately to duplicate that sort of economy in the new community would be an initial error of serious proportions.

With application, care, and experience the settler can produce for himself and his family a balanced, palatable, and nourishing food ration if the area in which he is settled has been properly chosen. In accomplishing this, the refugee settler will eliminate one cause of the early failures of white settlement in the Caribbean, and at the same time overcome what is still a marked deficiency in island economy. From the time of discovery, subsistence cropping and food production have been secondary to the production of something of export value, and too little of the export proceeds come back in the form of food imports. Although the Dominican Republic in recent years has made a more substantial effort than the other islands to increase the domestic food supply, the indications are that nowhere in this area is food production plus imports keeping pace with population growth. If the settler does not wish to participate in a shrinking food supply and declining standard of living, his safest course is to get on a self-contained basis—so far as food is concerned—at the earliest possible moment.

II. THE COMMUNITY FORM OF SETTLEMENT

There are several valid reasons why the refugee colony and its economy should be organized and operated as a closely knit community. Such vital matters as pure water supply, proper sanitation, health service, and agricultural guidance would be difficult to provide and even more difficult to supervise for widely scattered homesteads of settlers unaccustomed to either rural life or tropical risks. The cost of roads and communications and their maintenance alone prescribe as compact a system of colonization as proper land utilization will permit, and opportunity for religious gathering and social intercourse are added reasons. But beyond all this, there are the equally urgent considerations of an economic nature.

Initially, the settler is totally dependent upon the settlement

agency for food, shelter, care, and instruction preparatory to assuming these responsibilities himself. Few will find an opening in former trades or occupations. Vocationally the approach to independence will differ with differences of background, inclination, and temperament as between individual settlers. Some will want to become farmers; some would prefer to remain wage earners or practice former professions; some will desire to enter trade; and a few may originate some form of industrial enterprise. Basically, therefore, the settlement divides into three broad groups: (1) those who will till the soil, (2) those who will have labor or services for hire, and (3) a small number who may conceivably offer employment and a market for the products of agriculture by the process of trade or manufacture.² Here is a community of interest that demands community treatment. In an area of low economic standards and without political supremacy, the demand is imperative.

In the organization of settlement economy the first fact to be observed is that in the Dominican Republic the means of living must derive directly from agriculture. The number of non-farmers that can be supported and their standard of well-being will depend upon the surplus which agriculture is able to produce beyond direct consumptive needs of the producer. Non-farmers will have to acquire the surplus by exchanging labor or services of equal value. The number that the settlement colony can support outside agriculture is not, therefore, optional with the individual settler, but is a factor of collective agricultural production. It is a balanced relationship as difficult to attain as it is to maintain. Disturbed for even a brief period, one group, or both, will suffer.³ Obviously, the numerical relation between agricultural and non-agricultural settlers cannot be determined in advance or arrived at by arbitrary means.

For the Dominican economy as a whole, it takes 75 to 80 people in agriculture, including export crops, to support 20 to 25 in non-agricultural pursuits. This is merely another way of saying that on

² In most tropical areas of settlement, agriculture will be the major, if not the only, source of raw material. In the Dominican Republic about 80 per cent of all raw material consumed by industry is domestic, and practically all of this is produced by agriculture.

³ In the Caribbean at the present time there is a shortage of food production and a surplus of sugar which combine to depress standards of living all around.

the basis of current agricultural output only 20 to 25 per cent of the people can find support outside agriculture,⁴ and in both cases the standard of well-being is low. Eventually it may be possible for a smaller number of settlers on farms to support a larger percentage of non-farming settlers, but initially there is little prospect of their doing so.

Land available for settlement in the Dominican Republic is no richer than the average and much poorer than the best. To support more non-farmers and to provide a superior standard for all, the colonist must either have more land per capita than the national average or cultivate more intensely, or both. But as land areas are limited, any increase in the allotment per settler will directly reduce the number that can be settled. The refugee settler is already being allotted more than the national per capita average on farms.⁵ If more than 20 per cent of the colonists are to find non-agricultural occupation on a scale of living for both farmers and non-farmers superior to native standards, it seems reasonably clear that the settlement must engage in intensive agricultural effort. In the light of settler inexperience in agriculture, it is likewise reasonably clear that such an effort and the benefits to be derived can only evolve in the community form of settlement under experienced instruction and guidance.

The nature of the settlement economy is, therefore, an intensive agriculture primarily devoted to subsistence and organized on a community basis. Exclusive of those who wish to contribute by labor on farms, as distinct from homestead ownership, the resulting output will determine the number and character of non-farm pursuits open to settlers. In short, it must be a community economy balanced wholly upon its own agricultural output, in which sub-

⁴ The ratio of 80 to 20 is probably a fairly accurate measure of the relationship. The 1935 census put urban population at 18 per cent of the total which, to arrive at any such figure, would have to include many small villages whose chief occupation is agriculture. The 1940 agricultural census shows about 1,200,000, or 73 per cent, on farms covered by the census. This is probably somewhat low for the entire country. As of January 1, 1940, total population was placed at 1,650,000. If 1,320,000 are assigned to farms and 330,000 as non-farm, the division may be regarded as reasonably accurate.

⁵ Cultivated land, including pasture, now averages just under 2 acres per capita on farms as compared with 5 acres now allotted directly to settlers in the refugee colony.

sistence is the primary consideration, and usable surplus the major objective. The temptation to follow island tradition will be strong, especially if temporary war demands enhance the price of certain export products. To produce for easy cash and export and to buy food is an attractive idea, but the whole Caribbean group is a living testimony of the consequence.

III. REFUGEE INDUSTRY AND CASH INCOME

There is a noticeable tendency in settlement circles to look to some form of industry for immediate cash income, despite low competitive wages, limited domestic and foreign markets, relatively high capital costs, high taxation, high fuel and power costs, and the fact that only agriculture can provide refugee employment in volume. The tendency is a natural one, for not only is some cash income necessary, but the great majority of refugees were urban dwellers more familiar with industry and trade than with agriculture. Not all will become successful farmers, but at the same time there is no reason to assume that under the circumstances the non-farmers will succeed in industry any more than in agriculture. Dominican industry provides direct employment for only about 1 per cent of the population, and only 15 to 20 per cent is classified as urban. The small percentage deriving a livelihood from industry and trade is, however, no real indication of profitable opportunity in that field. Excepting sugar, Dominican industry primarily serves the limited domestic market, with annual sales ranging from 10 to 15 million dollars per year, about evenly divided between food-stuffs (not including sugar) and all other. If sugar is excluded, only about one-half of 1 per cent of the population find employment in industry, at wage rates ranging from 25 to 50 cents per day for unskilled labor, and from 50 cents to \$1.00 per day for semi-skilled and skilled labor, for an 8- to 9-hour day and a 48- to 58-hour week. And to provide for this kind of job the capital investment per worker is close to \$1,580.⁶

The basic question of a balanced relationship between refugee agriculture and industry is something that can be determined only

⁶ All figures except wage rates are derived from the 1939 industrial census. See Chap. 14 and App. C.

by careful approach and experiment. The source of refugee support is primarily agriculture, and the organization of refugee industry will depend almost entirely upon the agricultural development of the settlement as a whole. For instance, the production of surplus fresh milk beyond daily requirements of the colony would provide both opportunity and material for the manufacture of butter and cheese, supplementing and benefiting the community diet. But only if there is a surplus, for to deprive the colony of its full supply of fresh milk merely to manufacture butter and cheese for cash income, especially if sold outside the settlement, would be a questionable practice. Until the colony is entirely self-sufficient in foodstuffs the same thing would apply to the diversion of any other produce or land for cash income purposes.

The best opportunity for industrial experiment obviously lies in elaborating or processing the products and by-products of subsistence agriculture. Practically all these crops and products have a multiple use, providing raw material supply for community industry on the one hand, and safeguarding the community food supply on the other. Furthermore, industrial experiment and development along this line will enable the promoter to test the capacity and tastes of the market and to avoid over-commitment and over-extension. Finally, it would tend to limit industrial investment, pending opportunity to check costs.

All of these are important considerations. If, in development of the vitally essential subsistence program for agriculture, the foundation of a going community industry can be laid, it may be possible to hasten refugee employment in enterprises other than agriculture. Effectively organized, it might perhaps contribute materially to a solution of problems relating to industrial finance and operating costs. It is highly desirable that risk capital be supplied by some institution other than the settlement agency. Limited operations afford opportunity for experiment and study of methods, and in the process an effective means may be devised for a more appropriate allocation of the financial burden and risk of industrial development. If a superior standard of living is to be established, settler industrial costs are bound to be relatively high. The problem of high costs cannot be solved in a simple economy by mechanization without adversely affecting refugee employment and substantially

increasing the capital investment, wholly aside from the handicap imposed upon mechanization itself by relatively high fuel and power costs.

Except in rare instances of great individual industry and thrift, such an economy will never provide luxury. Wisely administered, however, it can be made to yield a goodly supply of the necessities and a relatively high degree of security for a limited number of settlers. Within it there is ample room for industrial experiment on a community basis and to the extent that agricultural development permits. Dairy products, canning, condiments and preserves, tanning and other processing of produce, together with further elaboration of the product, such as in saddlery, are the obvious fields of manufacture, just as medicine, surgery, dentistry, pharmacy, and veterinary medicine are the obvious professional fields. Once the food supply is assured, settlement farms can produce for community industry, but care must be exercised not to organize the latter on an uncertain or untested raw material supply, or to commit farmers to long-range production of one utility industrial crop. Likewise, to base either an industrial or agricultural program upon opportunity directly associated with war scarcity or war prices is to court disaster. Even in the tropics, the change from one major crop to another is slow, and wars of exhausting magnitude do not last forever. For the inexperienced in both agriculture and industry, prudence dictates a cautious approach and limited initial effort.

In the event that this approach to settler industry seems unduly cautious, it must not be forgotten that in addition to the reasons discussed, the Dominican settlement colony is prohibited by agreement from engaging in competitive enterprise. Not only does the initiation of refugee industry depend basically upon agricultural development of the settlement, but under the terms of its agreement with the Dominican government,⁷ the settlement is forbidden to engage in any activity which competes with native enterprise of a similar nature. Here is not only a sound reason for cautious procedure, but an added reason for confining the initial development of non-agricultural activity to the protected area of community needs.

In contrast to industry, the capacity to create employment for settlers in the professions and trades is relatively simple to measure.

⁷ App. D.

During the early stages of development practically all the essential professional and trade needs will have to be contracted for by the settlement agency itself. The extent of a continued demand for such services will become known in the course of operations. The sole problem is to displace non-settler talent and workmen with qualified refugees as rapidly as possible, and to shift their support from settlement agency pay rolls to the community as a whole. If an effective method of selection can be devised, qualified refugees may be brought over in advance for these positions and occupations, and dropped from the agency pay roll as fast as the colony is able to set them up in business. Aside from the medical services, surgery, dentistry, and veterinary medicine, all of which the community must eventually support if it is to endure, this likewise applies to such trades as blacksmith, carpenter, mason, tinsmith, electrician, harnessmaker, shoemaker, and barber. In a majority of the trades a simple set of tools is the only required equipment, and not all need workshops. Capital requirements are relatively small,⁸ but more important still, both the professions and trades can be incorporated into the community on the basis of far more accurate and concise data than is possible for industry. With a knowledge of those who wish to engage for their own account in the professions or trades, with experience as a basis of calculating the demand and need for the services, and with every possibility of estimating community ability to support the demand, there should be few errors or failures in this field.

Emphasis has been placed upon the closely knit community form of development, not because it is ideal, but because it appears to be the only practical method of establishing superior conditions in an area of low economic standards. While complete settlement isolation and self-containment are, of course, impossible, some such protective mechanism as the highly organized community offers is essential, initially at least. The suggestion that settlement policy should be directed toward elevating standards of the entire country to the desired level for settlers ignores many practical aspects of the problem. Dominican economy, resting as it does upon the ex-

⁸ Complete surgical or dental equipment is costly, but presumably the settlement agency will have provided all clinical essentials in its initial responsibility for settler care. Other equipment costs can be materially reduced by patronizing second-hand supplies for such things as barber equipment, etc.

port of agricultural products, functions today because the material standard of living is not high, and because the people have no choice but to accommodate themselves to exactions of the competitive market depressed by the exclusive tactics of the major importing nations. The material standard unquestionably would benefit somewhat from increased native supply of foodstuffs, but beyond that, improvement would require international abandonment of exclusive policies and the restoration of export demand at substantially better cost-price relationships than now exist, a matter entirely outside the sphere of settlement determination or control.⁹

The principal elements of Dominican economy have been described in some detail. In organizing a settler economy these basic characteristics cannot be ignored without grave risk of disappointment and ultimate failure. It must not be forgotten that primary income derives solely from agriculture and its allied industries; that arable land and the limited land resources are being rapidly occupied and too large a percentage depleted; that the economy is directly geared to the production of a surplus for export, and that disposition of this surplus hinges upon a foreign demand that is fickle at best and whose future is now totally obscure.

In recent years the country has been able to support on the aver-

⁹ The Dominican sugar industry, which so largely dominates the entire economy, is an excellent example of the current cost-price relationship and its effect upon living standards. About 95 per cent of sugar production is surplus and must be sold competitively for what the outside world will pay for it. Between 1937 and 1939 sugar sales declined about 40,000 tons, but owing to war demand and some speculation in the latter year the sales value was fully maintained at \$11,800,000. While total wages paid by the industry also remained practically unchanged at around \$4,910,000, the number of workers receiving wages increased by 4,422, and the average annual wage declined from \$214 to just under \$180. At the same time, labor costs per ton of raw sugar produced increased from \$10.55 to \$11.40.

Comparable figures are not yet available for the subsequent crop or current year, but the 1941 crop of around 400,000 tons has been sold at an average price of 75 cents per 100 pounds or \$16.50 per metric ton. If the entire amount is moved into consumption, the total value will not exceed \$6,600,000. Of this, 7 cents per 100 pounds is tax; 7 cents, cost of sack; and 3 cents, cost of putting the sugar alongside ship—a total of 17 cents per 100 pounds, \$3.75 per metric ton, or \$1,500,000 for the crop. The value of sugar sales to the industry this year, less export taxes, sacks, and handling, is not likely to exceed \$5,100,000, or but slightly more than the 1939 wage bill. It is inevitable that this loss will be distributed. Part of it will fall upon the sugar companies, but the rest will be passed back on independent cane producers, and all grades of labor. The enforced economies of everybody concerned will directly and adversely affect the entire community and the country at large. The 1942 crop, however, was sold at a much better price.

age only around \$8,000,000 of bank deposits, supplemented by an estimated \$4,000,000 of currency. The turnover of deposits plus an estimated turnover of outstanding currency indicates a total volume of payments in all categories, including government, of about \$200,000,000 per year.¹⁰ This roughly represents the average gross annual business of the Republic in late years—public and private. The per capita average of \$120 is much less impressive than the lump sum total.

Like its sister islands of the Caribbean, the Dominican Republic is poor. Although there is no official compilation of Dominican national income, a general idea of primary income produced can be obtained by combining the sales value of all industrial products as listed by the Estadística Nacional with the estimated value of agricultural production based upon preliminary returns of the official agricultural census. The following table shows rounded estimates of primary income produced in 1939, both in cash and in kind:

CASH INCOME

Industry	\$26,500,000 ¹¹	
Less agricultural raw material	6,500,000 ¹²	
Total industry		\$20,000,000
Agriculture		
Sold to industry	6,500,000 ¹²	
Sold for direct domestic consumption and export . .	8,000,000 ¹³	
Livestock, poultry, and products	5,500,000 ¹⁴	
Total agriculture		20,000,000
Total cash income		40,000,000
INCOME PRODUCED AND CONSUMED AT SOURCE ¹⁵		25,000,000
Total estimated primary income produced		\$65,000,000

¹⁰ See above, Chap. 15.

¹¹ Sales value of industrial production \$25,930,000 as compiled by the Director General de Estadística Nacional, 1939, plus an estimated \$570,000 for minor industry and handicraft not included in the report.

¹² Estimated value of domestic agricultural products consumed by industry, reinstated under agriculture.

¹³ While these estimates were based upon the 1940 agricultural census for quantity and reported prices for value, the amounts set forth and their allocation as between cash sales and production consumed at source were derived with the aid of official reports of industrial raw material consumption, export figures, and private estimates of marketings.

Of the total of \$65,000,000, only 60 per cent, or \$40,000,000, was cash income, with the balance of approximately \$25,000,000 representing agricultural production consumed at source.¹⁴ It will be noted that agriculture provides 50 per cent of the cash income and 70 per cent of total income. But as 80 per cent of industry is directly or indirectly concerned with the conversion, elaboration, or processing of agricultural products, the contribution of agriculture to national income is even more substantial than that indicated above.

Total primary income produced by the Republic is equal to only about \$40 per capita, while per capita cash income is just under \$25. The latter figure is important, for upon it falls the full burden of taxation. Of the estimated \$40,000,000 of cash income, government captures annually about \$12,500,000, or just over 30 per cent. After taxes, the cash income yields less than \$17 per capita. Though the impact of taxation is somewhat cushioned by methods of assessment,¹⁵ the effect is directly transmitted to the entire economy of the nation. In a country without access to credit, it is rather difficult to establish the fiction that government creates or produces income for any but the bureaucracy. The refugee settler, as a potential citizen, will ultimately be exposed to Dominican taxation, and the more so as he enters into commerce, industry, and trade.

It is in the light of all the foregoing that the matter of cash income will have to be approached and not from the standpoint of the industrial economies and standards of Europe or the United States. Income, particularly cash income, resting as it does upon markets, is a product of economic environment, and the limitations thus imposed cannot be ignored without penalty. The Dominican economy is dominantly agricultural, with industry incidental to the supply of agricultural raw materials, cheap native labor, a very limited domestic market, and an extremely fickle foreign demand. The refugee is tied directly into the Dominican agricultural economy through settlement on the land. At the risk of reiteration it must again be emphasized that this tie-in cannot be extended to the industrial field, either in the supply of raw material or its direct

¹⁴ This calculation of primary income produced does not include trade and service income or payments for government services.

¹⁵ Dominican taxation falls almost wholly upon business, commerce, and trade, both domestic and foreign.

manufacture, without exposure to competition with cheap native farm and industrial labor, jeopardizing hope of establishing a superior standard of living for the refugee colony.

It would seem that specialized agricultural trade is a much more logical and promising field for settler development and production of cash income than manufacture. If the settler can produce something from the soil which, in its natural state, enjoys, first, a community demand, second, a national demand, and third, an export demand to nearby markets, he will have a valuable article of trade. If he can produce a specialized product, competition will be reduced and the value enhanced.

At least one agricultural commodity meets these specifications. Unlike many of the Caribbean group, the Dominican Republic can produce beef cattle. There is a community, national, and export market for Dominican beef. The Sosua colony is not yet producing its fresh meat requirements. National consumption, while low, is expanding with population growth and will expand further on completion of modern slaughter and refrigeration facilities now under construction.¹⁶ Dominican cattle are already being exported to adjacent islands. Here then is an essential, usable, and marketable food product which in itself provides a profitable outlet for such settler crops as feedstuffs and fodder. Furthermore, it is highly probable that as a by-product of cattle raising an additional amount of fresh milk can be made available for the direct consumption of the refugee colony or for butter and cheese manufacture.

Although the present market for Dominican beef cattle—domestic and export—is limited by general poverty and low purchasing power, nevertheless the situation holds possibilities for settler exploitation. Dominican cattle are small and in no wise compare with the meat animals of North America or the Argentine. In a relatively short time, Argentina, by selective breeding, developed one of the finest strains of meat animal in the world. Though it may not be possible to duplicate this feat in a tropical climate such as that of the Dominican Republic, there is ample room for development of something better than now exists. On the demand side

¹⁶ A modern slaughterhouse is being constructed at Ciudad Trujillo, financed by a loan from the United States Export-Import Bank.

there is always the backlog of the colony's own need for fresh meat, a limited domestic and export demand, and a much larger potential which, with rising population and general dietary deficiency,¹⁷ needs only economic improvement in the Caribbean area to become progressively effective. Sale of one to four head of heavy cattle per settler family each year would provide a steady source of cash income.

From the colonization standpoint, and in contrast to manufacture, cattle raising involves relatively little additional capital expenditure beyond the working capital allotment. Herds build themselves, and under proper guidance maintenance costs can be held in approximate line with comparable native costs. But like everything else connected with refugee settlement, the operation demands a high degree of organization, expert administration, and technical supervision. All the usual imponderable risks will be encountered—animal disease, climate, weather, transport—plus economic and political eventualities affecting markets. On the other hand, the basic venture risk is small, for unlike an industrial undertaking, the settler community can always salvage a cattle breeding project via the butcher shop should the occasion arise.¹⁸

IV. INDUSTRIAL OPPORTUNITY

This chapter has repeatedly emphasized the conviction that in Dominican refugee settlement non-agricultural activity is a product of the total agricultural production of the settlement community; that the number which can be supported outside agriculture cannot be determined in advance; and that the processing of surplus subsistence crops or products for the community market is the logical and safest field for refugee industrial experiment. The discovery of some new raw material, produced by cheap native labor and suitable for refugee elaboration, might conceivably modify that con-

¹⁷ "The dietary of the average Trinidad laborer has the usual West Indian characteristics; that is to say, it is decidedly deficient in animal proteins and certain vitamins, with an excessive proportion of carbohydrates." G. St. J. Orde Browne, *Report on Labor Conditions in the West Indies*, 1939, Cmd. 6070.

¹⁸ An important asset of cattle raising is natural fertilization of pasture. This is widely recognized in a country too poor to buy artificial manure. What often appears to be neglect of the land is in many cases a long-range crop rotation which provides for a lengthy period of grazing.

viction, but not necessarily so. It is axiomatic that every industrial project must be judged on its own merits. The fact is that such a material does not now exist, and if it did the probabilities are that it could be elaborated more cheaply with native than with refugee labor. The only possible advantage the latter might have is in financing the project. But unless financed for settler account by other than the settlement agency, such diversion of funds would tend to defeat the major purpose of settling the largest possible number.

Yet strangely enough, the outstanding opportunity for agricultural-industrial effort lies within this field. Like any worthwhile industry, its development will require diligent, patient, and resourceful experiment and research. It is, however, one that might well occupy the attention of the settlement agency and such talent—refugee or other—as the agency can direct to it. A solution would provide not only a new and valuable money crop for refugee agriculture, and industrial opportunity as well, but would contribute in important measure to the economy of the entire country.

In recent years Dominican industry has spent about \$1,000,000 annually for containers, over 90 per cent of which are imported, and around 50 per cent of which consist of jute bags for the sugar, coffee, and cacao trade. For years the Western Hemisphere has been entirely dependent upon the Bengal Province of India for its huge requirements of jute and burlap, a dependence the British have further enforced by refusal to buy sugar and coffee in substitute sacking.¹⁰

In latitude the Dominican Republic is but slightly south of Bengal. Although the Republic may not be the ideal area to test the British monopoly, the low region around Sanchez offers as favorable a location as any in the country for the experiment. In any event the effort should be made both from the standpoint of settlement and of national economy. Though the result might not

¹⁰ The usual London contract calls for shipment of such products as sugar and coffee in new jute sacks. Sisal sacks, developed out of local fiber in Colombia and Mexico, were rejected. Despite the fact that sisal sacking has proved more durable than jute, especially for sugar, it is harsh, slippery, and somewhat difficult for the stevedores to handle, as bale hooks cannot be used on cargo of this character. In this instance the attitude of the stevedores made it difficult to combat British insistence upon jute.

equal the high-grade Bengal product, any reasonable degree of success would introduce a new agricultural money crop, create a weaving industry, fill a substantial local need, and meet a ready export market of vast proportions in the Western Hemisphere, as good in war as in time of peace.

V. DOMINICAN CAPACITY TO SUPPORT REFUGEE COLONIZATION²⁰

The amount of arable land available for settler farming in the Dominican Republic is not great. Although current population density—whether measured by the number of people per square mile or by acres per inhabitant—is low compared with neighboring islands,²¹ these figures are somewhat deceptive. On the one hand, estimates indicate that only about 25 per cent of the total national area is suitable for cropping, and on the other, native population is currently increasing at a rate which will require all idle or unused arable acreage for its own subsistence within the next 5 to 10 years.²² At the present time, the cultivated land per inhabitant amounts to but 1½ acres. To maintain even this low ratio in the face of an annual population increase of around 50,000 people²³ demands a net increase in area under crops of 75,000 acres per

²⁰ In connection with the discussion which follows, it should be noted that other members of the survey do not agree entirely with Mr. Smith's views regarding the capacity of the Republic to absorb refugees. This matter is discussed further in the chapter on general conclusions.

²¹ Currently 85 per square mile, and 7.5 acres per inhabitant. See table, p. 47.

²² The Dominican Republic contains 12,370,000 acres, which in round figures have been broken down as follows by the agricultural experts of this survey:

	Thousands of Acres
Now cultivated, crops and planted pasture	2,500
Potentially arable	500
Total arable area	3,000
Suitable for range	1,500
Suitable for tree crops	1,500
Forested or suitable for forest	4,000
Arid, abandoned, or unfertile	2,000
Lakes, cities, towns, villages, roads, and military areas	370
Total national area	<u>12,370</u>

²³ Dominican population is currently increasing at the rate of around 3 per cent per year.

year. The available area for expansion, even if raised to 750,000 acres by shifting cattle from cultivated pasture to range land, will be fully occupied in 10 years at the present rate by the natural growth of native population. Refugee settlers are now being allotted 5 acres of arable land. On this basis, the 100,000 refugees originally invited by the government to settle in the Republic would require practically all the available crop land, leaving none available to meet the needs of an expanding population. It therefore seems clear that Dominican capacity to absorb immigration for permanent settlement is limited to something substantially less than that number.

Any estimate of Dominican capacity to absorb and support refugee colonization must essentially rest upon existing conditions. A slowing of the population growth, an improvement in agricultural methods, and a change in fiscal policy abolishing or materially relieving consumption taxation²⁴ would unquestionably result in better utilization of the land and its produce, release an added limited acreage for immigrant colonization, and at the same time provide a safer margin for natural growth. But refugee settlement cannot be based on the assumption that any of these things will materialize. Therefore, aside from the expectation that organized colonization itself will adopt a rational program of land utilization, possibilities or probabilities of such a nature have been totally ignored in the estimates which follow.

In addition to the 5 acres of land per settler unit²⁵ now allocated for house, subsistence garden, and cultivated pasture, a similar amount will be required for settler training and experimental and commercial crop purposes. Initially the latter must be maintained and operated by the settlement agency. About 10 acres of land

²⁴ Rice and sugar are typical instances of the effect of taxation on native consumption and production. While increased domestic production has displaced rice imports during the past 10 years, rice production is currently declining under a tax of 3 cents per pound, and with imports shut out by heavy duties, consumption of this popular food product suffers accordingly. Largely because of taxes, the current domestic price of sugar is 5 cents per pound in a country that sold its entire export surplus in 1941 for 34 cents (raw value), or the equivalent of about 134 cents on refined. In addition, other taxes on retail and wholesale distribution, inevitably passed on to the consumer, serve to increase export surpluses at the expense of consumption.

²⁵ The settler unit may be either a head of family, with wife and dependent children, or a single adult potential head of family on the land.

suitable for tree crops or forests will be needed, and, depending upon location and rainfall, about 15 acres of natural range. Altogether, the operation will require a minimum of 35 acres per settler unit on the average for independent subsistence and an opportunity to develop a superior standard of living. On the basis of 300 settler units as a minimum nucleus of community organization, each settler community will require in total about 3,000 acres of good arable land, 3,000 acres of suitable tree-crop and forest land, and about 4,000 to 5,000 acres of natural range, or a total of around 11,000 acres.²⁶

In the entire Dominican Republic it would be extremely difficult to find more than twelve such areas where juxtaposition of land types, adequate rainfall, pure water supply, communication, and healthful climate are combined within the limits of effective community operation and administration. The colonization capacity of the Republic may, therefore, be placed at around 3,600 settler units, or, based on current refugee immigration,²⁷ a total of about 5,000 refugee immigrants. Over a period of time such an influx would require a total of 36,000 acres of the available arable land, an equal amount of suitable tree-crop and forest land, and some 54,000 acres of natural range, or a grand total of around 126,000 acres of all types. Considering the expanding requirements of the rapidly increasing native population, even this is a high percentage of available land to divert to immigrant use, for in all probability at least twice that acreage will have to be purchased in waste land or forest in order to obtain the proper proportion and consolidation of land types required.

However, these estimates must be regarded as a measure of capacity rather than a practical scheme of land allocation. That such an arrangement would meet all the requirements of practical operation is doubtful. To begin with, some of the smaller areas available for settlement are too remote and too isolated. For such locations the cost of both development and operation would be excessive. On the other hand, some of the more extensive areas lend them-

²⁶ This allocation is elastic and, within reasonable limits, can be adjusted to the terrain.

²⁷ Up to June 30, 1941, refugee arrivals consisted of about 30 per cent women and children. A higher percentage of white women should be imported if a sound community life is to be established.

selves to relatively large-scale development. Second, 10 acres of arable land per settler unit is a minimum providing altogether too narrow a margin of safety. Third, the ratio of settler units to dependents in current refugee immigration is creating an unbalanced community. All of these are vital considerations from the standpoint of enduring, efficient, and successful operation, and, within prescribed limits, call for some adjustment. The alternative is the obvious one. By reducing the number of settlements and increasing the average population per settlement, a more concentrated effort is possible. By increasing the allotment of arable land per settler unit, a greater margin of safety is provided. Finally, by reducing the number of heads or potential heads of families and increasing the number of female dependents, a better balance is established for the community as a whole. In this way the total number of refugees to be accommodated remains unchanged; the arable area per family is increased with but slight change in the total arable area required; and at the same time the total acreage of all types of land required for colonization is reduced by about 20 per cent, leaving that much more land for natural growth of native population.

As the adjustment is easier to visualize when set up in tabular form, the following table presents both the original estimate of Dominican capacity to absorb refugee colonization and the foregoing adjustments covering composition of immigration and allocation of land:

1. *Capacity estimate.* Basis: 12 areas capable of supporting 300 settler units. At the current ratio of heads or potential heads of family to dependents, this would provide for a total refugee influx of about 5,000 people, or an average of around 415 per settlement community.

Type of Land	Total Acreage Required	Acres per Unit
Arable land	36,000 acres	10 acres
Tree-crop land	36,000 "	10 "
Range land	54,000 "	15 "
Total	126,000 "	35 "

2. *Adjustment.* Basis: 2,500 heads or potential heads of family and 2,500 dependents, or 5,000 people, to be located on not more than 7 areas in settlements ranging from 600 to 1,200 people each.

Type of Land	Total Acreage Required	Acres per Unit
Arable land	37,500	15
Tree-crop land	25,000	10
Range land	37,500	15
Total	<u>100,000</u>	<u>40</u>

The adjusted allotment will permit effective organization of the settlement on a community basis. It will provide ample acreage for settler training and community subsistence pending settler ability to feed himself and family. The arable area allotted each settler unit is sufficient for food and fodder crops, poultry, and home pasture, while the tree-crop and natural-range land—whether individually or co-operatively operated—is spacious enough to enable the settler to plant both subsistence and cash income tree crops of a fruit-bearing and commercial product nature, and to allow the development of a livestock and animal industry. In short, this arrangement of land areas is designed to give full effect to the utilization programs discussed in Chapter XVIII.

From the standpoint of successful colonization, current costs, even for the relatively limited settlement program indicated above, are not reassuring. At the present rate of \$3,000 per settler unit exclusive of land, colonization of 3,600 units will require at least \$11,000,000 and probably more. Although it is impossible to estimate land costs in advance of selection, the areas and types required, plus the necessary purchase of incidental acreage—say a minimum of 250,000 acres all told—may conceivably add as much as \$2,000,000, or a grand total of just over \$3,600 per settler unit.²⁸

It is extremely improbable that settlers in the Dominican Republic can carry and amortize this amount of initial debt. To the extent that they do not, the burden falls upon the settlement agency. Should the postwar problem of settlement merely involve the colonization of 3,000-5,000 refugees from all sources, the settlement agency might contribute the difference between cost and possible repayment. But as it exceeds that figure, the financial ability to settle the excess elsewhere is progressively impaired. Current high costs constitute one of the items which create doubt as to whether refugee

²⁸ On the basis of 2,500 settler units these costs would be reduced to \$7,500,000, plus about \$1,500,000 for land, or to a total of around \$9,000,000. The cost per settler unit would, however, still remain the same, that is, \$3,600.

settlement is possible on a scale commensurate with probable need.

This matter of costs is important even if Dominican settlement is regarded as an isolated instance and the financial responsibility of a group with no further commitment in the settlement field. Obviously a reduction in costs will either serve to reduce the present deficit or the amount chargeable to the settler.²⁹ The individual settler's prospects would be vastly improved if his initial mortgage debt did not exceed \$1,000, for in the long run settler access to future credit will depend upon reduction of the original debt.

The whole cost structure clearly demands careful study and revision by the settlement agency. In the housing item alone—a major element of Dominican cost—expenditures range from \$450 to \$750 per unit, depending upon type.³⁰ Present types are defective in design, construction, and durability for a tropical hurricane area where insect damage to wooden structure is rife. In commenting upon housing built in the Bahamas following devastation by the 1929 hurricane, Major G. St. J. Orde Browne noted: "This evolved an interesting type of sturdily-constructed little wooden houses for the surprisingly low figure of £45 to £75 according to type. . . ."³¹ Settlement authorities might profitably investigate Bahama housing.

Costs are only one of the organizational problems with which refugee settlement must deal more effectively if the effort is to acquire economic substance and durability. Another arises from the question of selection. Unless some better basis for selecting candidates can be devised than the immediate emergency of the individual refugee, prospects of successful colonization are dubious. Beyond this lies the whole range of interrelated problems of organization briefly reviewed in the general discussion of the subject.³²

An attempt has been made to outline the major elements upon which refugee life depends in the Dominican Republic. What is prescribed is not a managed economy, but the organization of a

²⁹ Sosua costs to date are approximately \$3,000 per settler unit, of which it is proposed to charge \$1,600 to the settler.

³⁰ One family, one- and two-room units respectively. Although these costs were supplied by the Sosua Management, the Homestead Plan for Sosua Settlers, dated June 1, 1941, includes as the largest single item in the \$1,600 charged to the settler, a figure of \$800 for house and one hectare of land. An additional hectare is charged at \$35, indicating an average house cost of \$765.

³¹ *Labour Conditions in the West Indies* (1939), Command Paper 6070.

³² See Chaps. 2 and 3.

management capable of successful operation within the field of endeavor; the development by refugee labor of such resources as exist; and the establishment of an enduring refugee colonization upon those resources. The resources will not develop themselves, and it will require highly comprehensive organization to select and prepare the site, bring the untutored refugee to the task, protect his health, and instruct him in the technique of tropical agriculture to the end that he and his descendants may found upon the land a new, essentially simple, yet more secure mode of life.

But in looking to the future, there is one matter which cannot be ignored with impunity. The fact is that, from the standpoint of the number it will accommodate, the Dominican Republic can never be more than a minor factor in refugee settlement. It is quite probable that the current high costs of re-locating the refugee arise primarily from small-scale operations; that this vital factor of unit costs and successful settlement will yield only to concentrated operations on a scale which involves units of a million or more acres of good arable land; and that effective organization should be based upon some such concept. Certainly the magnitude of the problem itself demands broad treatment if any appreciable numbers are to be permanently transplanted. However, a commitment has already been made within the Republic. At the end of August 1941, some 400 refugees were in process of establishment there. A few more have arrived since that time, despite obstacles to travel, but this movement is now all but terminated by the entry of the United States into the war and the extension of war to the Pacific. The Dominican settlement agency is thus afforded opportunity to review the situation, digest existing problems, and take stock of the future.

There are two obvious alternatives: (1) the pause in immigration can be utilized to prepare additional areas in the Dominican Republic for a prospective refugee influx in the future up to the potential capacity of the country to support them; or (2) the commitment can be limited to the number already there, and future efforts directed solely to assuring their sound and permanent settlement.

The choice of alternatives involves a frank recognition of all essential elements of the problem. Primarily it seems clear that despite the generous invitation of the Dominican government, not

much more than 5 per cent of the number of refugees invited can be accommodated. Second, the expense of locating settlers in remote and widely scattered communities will be both relatively and actually large. Third, the economic opportunity for settler development is not great. Except for perfecting the organization to do it, these are the basic considerations governing such limited expansion as the Republic offers.

The factors governing limitation of effort to existing numbers are equally clear. Existing refugee population has not yet been digested. The arable area of the present colony is not sufficient to support arrivals to date. As now organized and constituted, the colony will require strong financial support for an indefinite period. Until a self-sustaining mode of life has been organized and sufficiently established to assure a reasonable degree of success for the existing refugee population, the project partakes more of refugee relief than refugee settlement. Unless the refugee can be firmly established on his own, independent of continuing subsidy, the attempt must be regarded as both an ineffective means of settlement and an extravagant form of relief.

In arriving at a decision, some perspective is essential. Just prior to the war, President Roosevelt spoke of finding new homes for millions of refugees. When the war intervened the Intergovernmental Committee was concerned with the problem of transplanting some 500,000 actual and potential refugees from Greater Germany. General Trujillo generously offered to receive 100,000 into the Dominican Republic. But with due allowance for its own increasing population, the capacity of the Republic to absorb and support refugee colonization is now found to be not much in excess of 5,000 persons about evenly divided between heads of family and dependents. In two years of settlement activity, only about 400 persons, or less than one-tenth of this capacity, have been moved into the Republic, and at that the colony is overcrowded. On this record alone it seems fairly obvious that a successful solution of refugee distress depends upon something more than the compassion of statesmen, the generosity of philanthropists, and the unselfish efforts of humanitarians. The war stoppage of refugee emigration, tragic though it be, at least provides opportunity for a reorientation of approach and a reorganization of method.

CHAPTER XX

GENERAL CONCLUSIONS

It was stated in the Foreword that the principal questions with which the survey had to deal were: (1) Is the Dominican Republic a suitable place for refugee settlement? (2) How may refugee immigrants make a living there? (3) How many settlers can the Republic absorb? (4) What will be the effect of the settlement project on the Dominican community? (5) What part will the project play in the solution of the refugee problem as a whole? We may now consider how far it has been possible to answer these *problems*.

I. IS THE DOMINICAN REPUBLIC A SUITABLE PLACE FOR REFUGEE SETTLEMENT?

Under this heading we have to consider: (1) the effect of tropical climate and tropical diseases; (2) whether it is possible to settle immigrants in a small country where most of the good agricultural land is already in use and where living standards are generally low.

With regard to the first of these questions, we do not believe that a tropical climate is necessarily a serious disadvantage. While some authorities maintain that a white community, as a community, has little chance of maintaining living standards and its individual vitality under tropical conditions, the results of such studies as have been made on this subject are inconclusive. At any rate, from the standpoint of the individual settler, life in the tropics will be far better than the conditions which he leaves behind him. The average north European, in fact, should be able to live comfortably in a climate like that of the Dominican Republic. There is no reason to believe that physical labor in such a climate is impossible or harmful. On the contrary, experience seems to indicate that those who engage in hard work outdoors remain in better health than those who do not. It may be pointed out that the average farmer in the United States works longer hours in summer under much higher temperatures than are encountered at Sosua. On the other hand, the greater humidity of a trade-wind island of course makes high temperature

more uncomfortable and to some extent cuts down the efficiency of the foreign laborer.

Tropical diseases are, of course, a serious problem, but modern medical knowledge has made them less dangerous than they once were. It may be questioned, indeed, whether a resident in the North does not suffer more from colds, influenza, and pneumonia than an intelligent resident of the tropics need suffer from malaria or intestinal diseases.

We feel, however, that the health problem must receive far more attention from the Settlement Association than it has thus far. Though the Dominican Republic is a relatively healthful country, malaria, dysentery, hookworm, and other diseases, which have always been dangerous enemies of the white man in the tropics, are prevalent there, and it does not appear that adequate precautions are being taken against them. The water supply at Sosua, for example, is taken from a stream just below a traveled road, and at the time of our last visit conditions around the bathing beach were such as to make hookworm infection extremely probable. The settlers' houses were not screened. The fact that health conditions at the colony seem thus far to have been generally good does not lessen the importance of guarding against dangerous diseases, which at any time may become serious among a large group of non-immune immigrants. Some 40 cases of malaria were, in fact, reported during the colony's first year. We understand that the Settlement Association is taking steps to have a study of sanitary problems made. It will be desirable, in our opinion, to have the study cover the entire Republic, with a detailed examination of each area where settlement is likely to be attempted in the future.

The relatively small amount of unoccupied land clearly presents a more serious obstacle to the success of any settlement project. This limitation will definitely affect the colony's expansion and must constantly be borne in mind in estimating the number of settlers who may be taken care of. On the other hand, it will not necessarily prevent the successful exploitation of the properties which the Settlement Association now holds or may be able to acquire. It is true that the Dominican population is rapidly increasing and that the island may eventually be as overcrowded as some of

the other West Indian countries are. Much of the land, however, is not efficiently utilized at present, and it is quite possible that better methods of cultivation, full utilization of water resources, and the introduction of new crops will bring about a great increase in the country's productive capacity. If the colonists and the Settlement Association can contribute toward such an increase, it may be possible to produce sufficient food for a limited number of newcomers, and perhaps even raise the general standard of living.

The low standard of living of the majority of the Dominican peasants is likewise a factor which will limit the number of settlers who can be brought to the country. This factor makes it unlikely that immigrants can find employment as day laborers in agriculture or industry, and very greatly restricts the local market for any products which the immigrants may grow or manufacture. On the other hand, we need not assume that the settler must resign himself to a similar degree of poverty. If the colony is efficiently administered, he should be distinctly better off than the average Dominican peasant. With proper training and supervision, he should learn to be a better farmer. He can be taught how to handle tools and machinery and what crops to grow for an economical balanced diet for himself and his family. Most important of all, perhaps, he will have an initial capital in the form of house, land, livestock, and tools that will place him at the outset on a level above that of his poorer neighbors and that will help to offset the disadvantages under which he will labor. The Dominican peasant who works for 20 to 30 cents a day is poor because he is ignorant, has no working capital, and has an insufficient amount of land. The settler's situation will not be comparable to that of the peon, but rather to that of the more prosperous Dominican small farmer.

II. HOW MAY REFUGEE IMMIGRANTS MAKE A LIVING?

We have emphasized in this study the fact that the first task of the settler will be to provide a balanced subsistence for himself and his family. He will also need some cash income to buy articles which he cannot produce and to pay interest on his debt to the Settlement Association. Both subsistence and cash income in most cases will have to come from farming.

In the first years, at least, the extent to which the settlement can become self-supporting will depend chiefly upon the efficiency with which it is organized and administered. The Settlement Association will probably have to do far more for the colonists than would be expected from the management of a similar enterprise in the temperate zone, or from the directors of a colony dealing with better-adapted human material. In the first place, the settlers must be given agricultural training, which almost none of them have now. Making farmers out of city-dwellers is always a difficult task, and it will be especially difficult to teach city-dwellers to make a living in tropical agriculture. This will require individual instruction in the first months at the settlement, and careful supervision for a considerable period after the settler is placed on his own homestead. Such instruction can obviously be provided only if the Settlement Association has an adequate and competent staff.

It will be especially necessary to give the settlers constant guidance as to the products which they are to raise, both for their own use and for sale. Attempts to plant temperate zone vegetables, for example, or to cultivate crops that do not afford a high yield in relation to the amount of labor involved, may result in loss of time and in discouragement harmful to morale. We have stressed in Chapter XVIII the desirability of a carefully worked out subsistence program for the settlement as a whole, and it will be essential to adopt and carry through such a program if the settler is to obtain an adequate diet for himself and his family, and at the same time have part of his land and labor available for some cash crop.

Providing a money income for the settlers is perhaps the most difficult problem of all. In the early stages of Caribbean colonization, "colonial" products brought in great wealth and created the impression that in the West Indies riches could be easily obtained. In recent years, few or none of the principal crops formerly produced, such as sugar, tobacco, coffee, and cacao, have offered very attractive possibilities as commercial undertakings for the small farmer. Some of them have been greatly overproduced; others must be grown on a large scale with a heavy investment of capital in order to make a profit. It is by no means impossible that individual settlers, under favorable conditions, may find it profit-

able to grow bananas or cacao; but it does not seem likely that any of the great tropical staples can be expected to yield a cash income for any large portion of the community. The settlers will probably have to find other products which can be grown advantageously in the Dominican Republic and for which there is a local or foreign market. Several possibilities have been suggested in Chapter VIII, but the advisability of cultivating any particular product will depend upon the state of the market, the availability of transportation, and the actual experience of the settlement with its cultivation. It seems probable that the solution of the problem of money crops will be found in the cultivation of a considerable number of different products, and that it will be inadvisable, at least under present conditions, to put too many eggs in one basket.

It should be possible to sell a part of the colony's products in the Dominican Republic itself, especially in the immediate future, when war demands and rising prices may be expected to make the country somewhat more prosperous than it has been for several years. For example, there should be a demand for certain vegetables which Dominican farmers do not now supply in sufficient quantities, or for new fruits and vegetables which the settlers, with competent advice from agricultural specialists, might be able to introduce. It is understood that a few hundred dollars' worth of tomatoes were sold locally by the settlers last year. It may be possible to make and sell cheese and preserves in the same way. Such possibilities should by no means be overlooked. At best, however, the local market seems too restricted to provide a substantial money income for any very large number of settlers.

It will consequently be desirable and probably essential to find new products that can be profitably exported. Here the Settlement Association's help will be particularly necessary—in introducing such products, experimenting with their cultivation, and finding markets. The individual colonist, with his limited amount of land and his urgent need to make every hour's work profitable, cannot well do any of these things for himself. Even groups organized as co-operatives will not have the resources to do them effectively unless the Settlement Association stands back of them. In many cases the exploitation of what appear to be promising opportunities

and the character of the internal organization of the colony are matters that will have to be worked out on the basis of experience.

It seems clear that the settlement must count on agriculture as its principal source of income. It doubtless can and should attempt to develop small industries utilizing local products and meeting demands in the local market or abroad. As suggested above, cheese-making and the preservation of fruits may offer good possibilities. The colonists might also develop production on a small scale of smoked meats and fish, special cookies, and so forth, and possibly the production of certain types of ladies' and children's dresses or other clothing. Making articles for sale to tourists might be profitable if there were individual settlers who had the necessary ability and imagination. Such an industry, however, and indeed such undertakings as cheese-making and fruit-preserving, will depend for success upon the ability to produce a superior product and upon enterprise in finding markets for it. They probably offer little hope of profit to the settler who does not have special skill and ingenuity.

In general the possibility of occupying any large number of settlers in industrial pursuits seems small. The description of existing Dominican industries in Appendix C will show how little opportunity they afford for employment of north Europeans. The establishment of new industries would in most cases require so large a capital outlay as to make it inadvisable for the Settlement Association to consider them. Furthermore, there would be little advantage in creating an industry which would employ settlers at prevailing Dominican wage rates. On the other hand, paying higher wages would make it difficult for the enterprise to compete, either with similar Dominican enterprises or with imports from abroad.

III. HOW MANY SETTLERS CAN THE REPUBLIC SUPPORT?

If the settlers can be given adequate agricultural training and a sufficient amount of land for their support, and if the enterprise as a whole is administered efficiently, there seems to be no reason why a limited number of colonists could not support themselves in the Dominican Republic. It would be impossible at the present time to make more than a vague guess as to what this number will be. It seems probable that the Sosua tract cannot accommodate more than the number of colonists already established there. The ex-

pansion of the undertaking will require the purchase of additional land and will be limited by the amount of land which can be obtained. There are several large tracts in the Republic which might provide homesteads for additional settlers if they could be acquired and if they proved satisfactory from the standpoint of soil conditions, rainfall, and so forth. For various reasons, it was not practicable for the Survey to make a detailed examination of these areas, but a rough estimate indicates that they may total from 200,000 to 300,000 acres. It is quite unlikely, of course, that all of these tracts would be suitable or available.

In any event it would be inadvisable to attempt any rapid expansion of the settlement under present conditions. The limited internal market for agricultural products and the difficulty of finding export markets make it wiser to proceed very slowly. We believe that settlers should be brought in only in relatively small groups, and only after careful consideration has been given to the amount of agricultural land actually available, the possibility of marketing the products which they can grow on this land, and to the Settlement Association's own ability to handle the newcomers effectively. Unless it seems imperative to bring large numbers of people to the Republic simply to save them from persecution, it would clearly be better to establish a small successful colony on a sound basis than to take the chance of failure by over-rapid expansion. By proceeding gradually it might ultimately be possible to settle from 3,000 to 5,000 immigrants in the Republic and it might eventually be possible to take care of an additional number in industrial undertakings.¹

IV. THE EFFECT UPON THE DOMINICAN COMMUNITY

The colony can contribute much to the welfare of the Dominican community. Some thousands of healthy and intelligent Europeans will be a welcome addition to its population, and the capital which they bring with them will increase the national wealth. Much of the money already spent at Sosua has gone directly into the pockets of native workers and merchants, and, as the colony develops, it will offer additional markets for local labor and local products. The development of new sources of wealth, the introduction of

¹ In Mr. Lee's opinion the Republic would accommodate around 10,000 settlers.

new plant varieties, and a general increase in production should make the country as a whole more prosperous. If the settlers can become successful farmers, their Dominican neighbors will copy their methods and learn to raise and sell the same products. At the same time, increasing prosperity in the local community will provide enlarged markets for the settlers' products and in many other ways will make the country a better home for them and their children. The officers of the Settlement Association, from the beginning, have wisely emphasized the fact that the Republic as a whole must benefit from the Association's activities if these activities are to be successful.

The welfare of the colony, now and in the future, will of course depend on the general prosperity of the Dominican community. It is for this reason that we have mentioned in the preceding chapters some of the outstanding economic problems which confront the Republic at the present time. Soil conservation, for example, is a matter which demands immediate attention if the Republic is to avoid irreparable injury to what must always be its chief source of wealth. The development of irrigation projects and the improvement of means of communication are important both to native farmers and to immigrants, and all producers would benefit if means could be found to relieve the present rather heavy tax burden. It is to be hoped that the Board for Social and Economic Betterment, which the government has recently set up under the chairmanship of Generalissimo Trujillo, will give consideration to these problems.

V. RELATION TO THE REFUGEE PROBLEM AS A WHOLE

Though only a relatively small number of refugees can hope to find homes in the Dominican Republic, the Sosua project may have great importance in demonstrating that successful refugee colonies can be established under tropical or subtropical conditions, and that their establishment promotes the prosperity of the country which opens its doors to them. If it succeeds, other American republics may follow the example so courageously and generously set by the Dominican government. Some of these other countries could, if they would, provide homes for many times the number of immigrants that could be absorbed in the Dominican Republic.

The hope that they may be induced to do so, plus the fact that every individual who does find a home in the Republic is a human being saved from death or degradation, more than justifies the effort and expenditure which the Sosua project has involved.

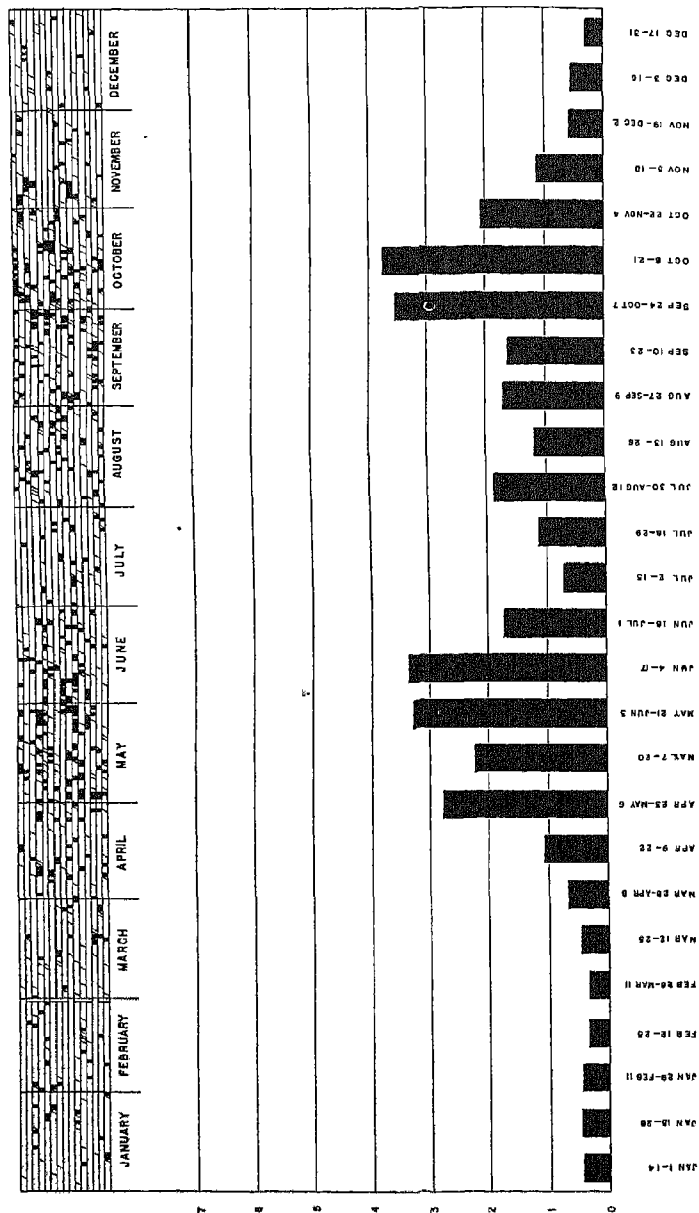
The material presented in this report indicates that refugee settlers in the Dominican Republic will have to meet many difficult problems. They will have to adapt themselves to life as farmers under strange climatic conditions. Their opportunities will be limited by the small amount of agricultural land available for their use, by the poverty and low standard of living of the majority of the country's present inhabitants, and by the uncertain future of nearly all major branches of tropical agriculture.

Under more normal circumstances, these conditions might discourage the prospective immigrant who was free to choose whether to leave his own country and where to select his new home. The persons for whose benefit this survey has been made, however, have no freedom of choice in either respect. Their intolerable situation in Europe compels them to leave if they can find any avenue of escape, and the opportunities to find new homes abroad are limited. The Dominican Republic is one of the few countries in the world offering admittance to a considerable number of them. The question is not whether the Republic is a good place for agricultural colonization, but rather what can be done to promote the welfare of the colonists already there, how far their number can safely be increased, and what steps can be taken to make sure that the establishment of refugee colonies can be made beneficial both to the settlers and to the people of the Republic.

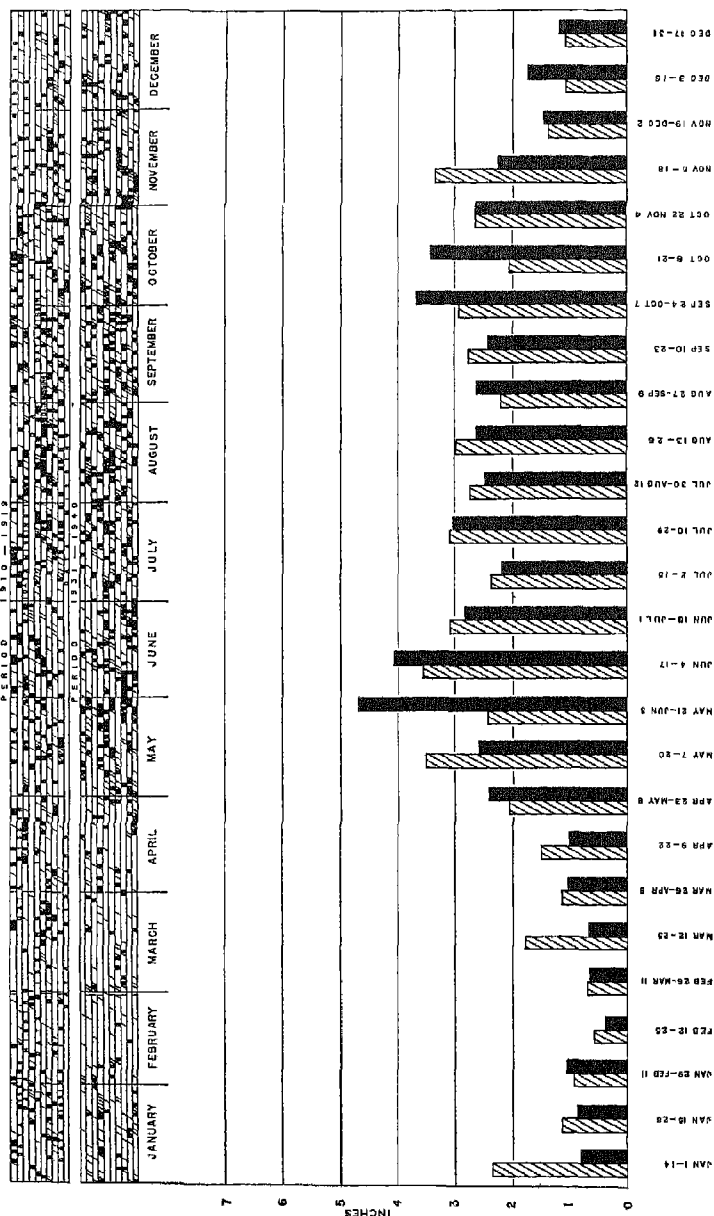
The problem, in short, is to make the most of the opportunities which the generosity of the Dominican government and of the financial backers of the Settlement Association have offered. If the colonization project is properly managed, we do not believe that any of the difficulties mentioned above will necessarily prove fatal to its success. The Dominican Republic cannot be expected to provide new homes for a very large number of refugees, but an effort can be made to establish a small number there under conditions that will demonstrate the practicability of settling larger groups in other tropical countries which have more land and greater undeveloped resources.

APPENDIX A
RAINFALL CHARTS

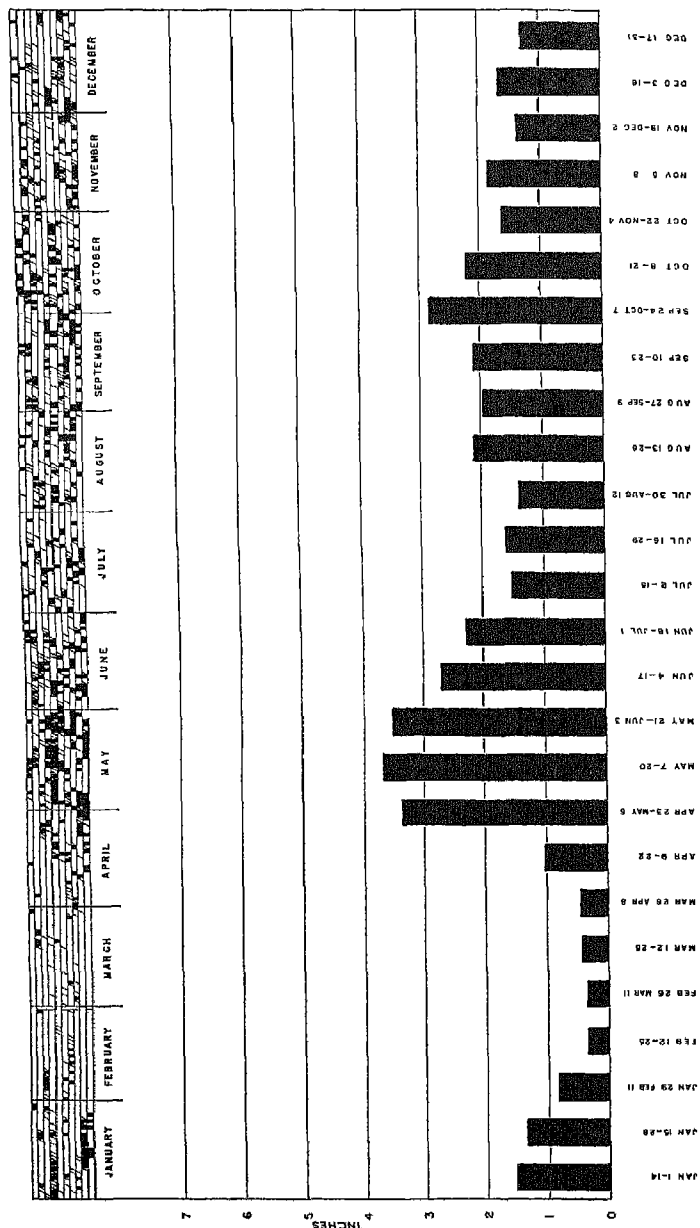
RAINFALL AT CENTRAL BARAHONA-BATEY OVER 15-YEAR PERIOD (Yearly average 37.84 inches)



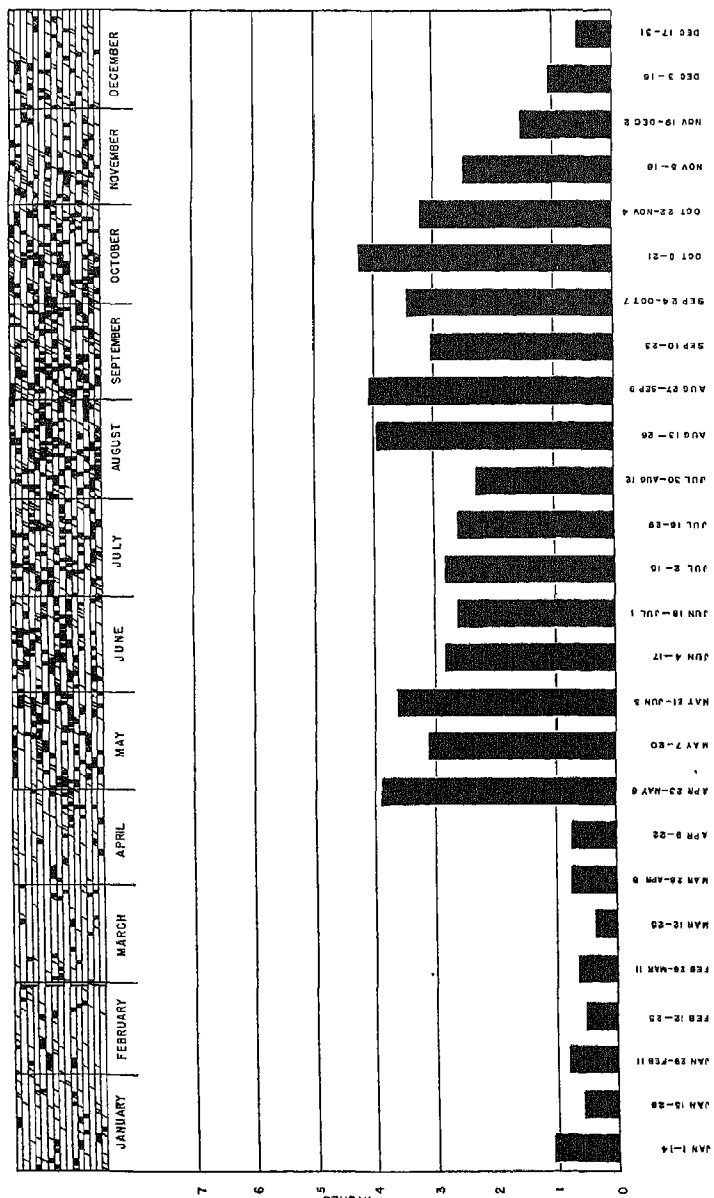
RAINFALL AT CIUDAD TRUJILLO OVER TWO 10-YEAR PERIODS, 1910-19 AND 1931-40
(Yearly average 1910-19, 55.23 inches; 1931-40, 54.73 inches)



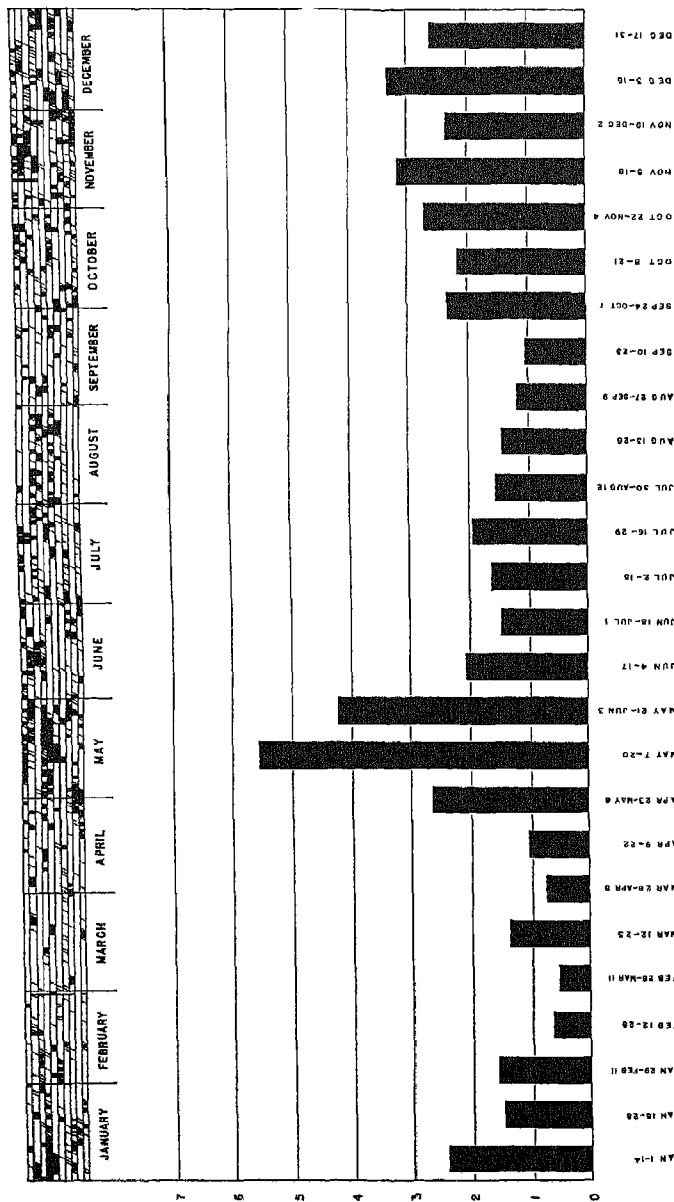
RAINFALL AT CONSTANZA OVER 10-YEAR PERIOD (Yearly average 45.70 inches)



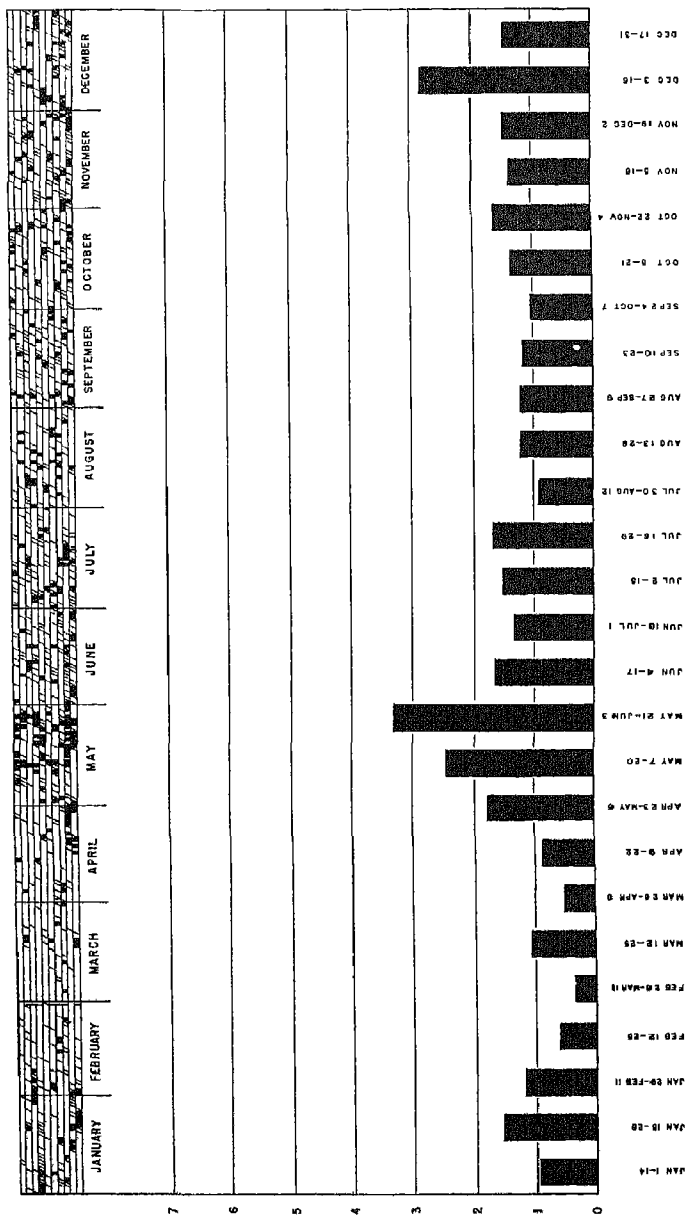
RAINFALL AT CENTRAL CONSUELO-BATEY OVER 15-YEAR PERIOD (Yearly average 57.31 inches)



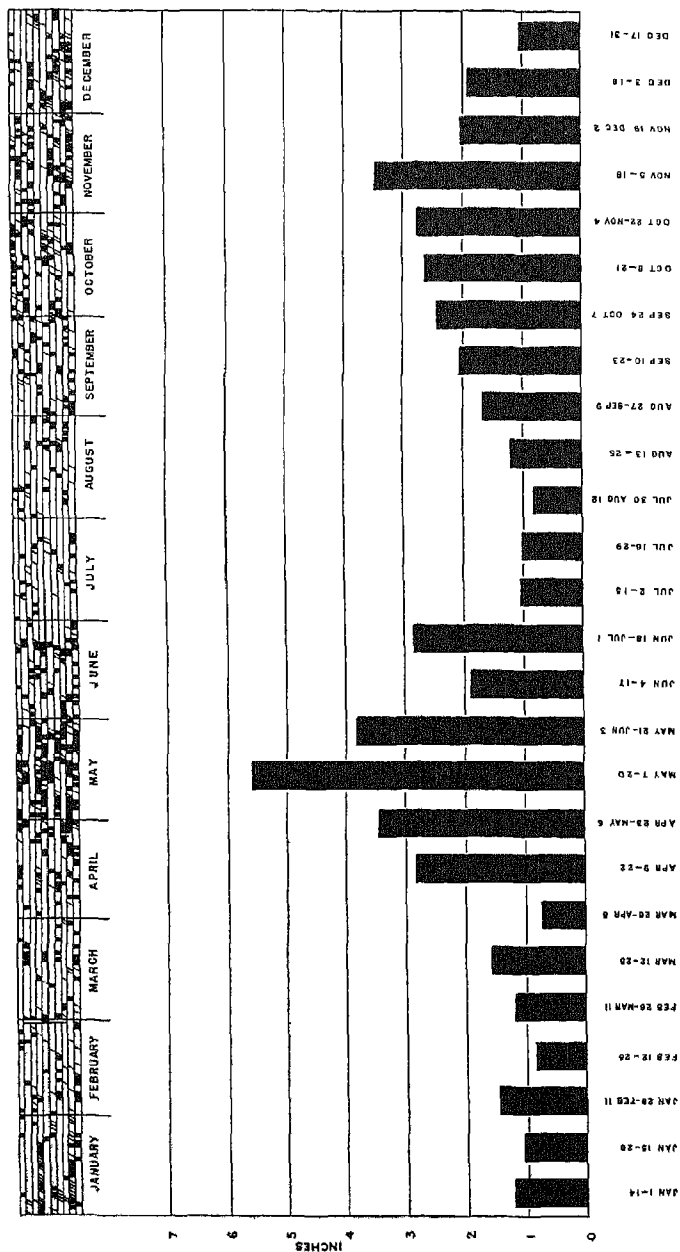
RAINFALL AT LA GINA OVER 10-YEAR PERIOD (Yearly average 53.34 inches)



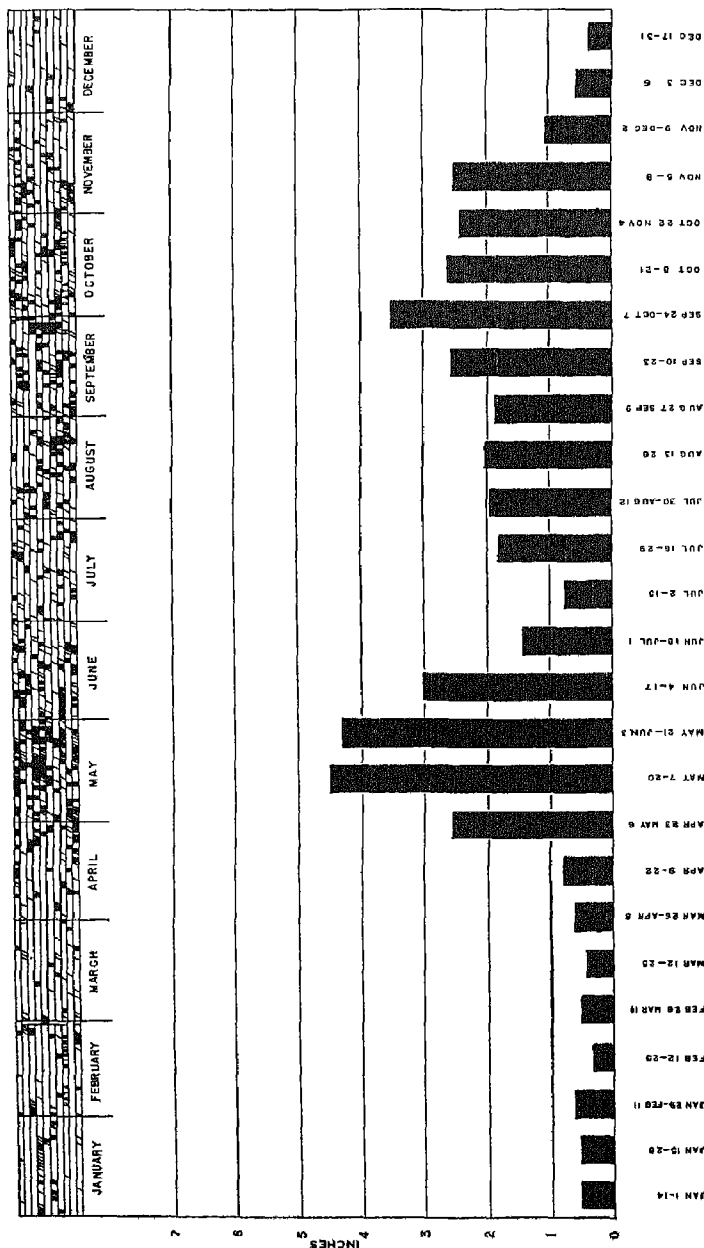
RAINFALL AT HOSTOS (LA CEIBA) OVER 10-YEAR PERIOD (Yearly average 36.66 inches)



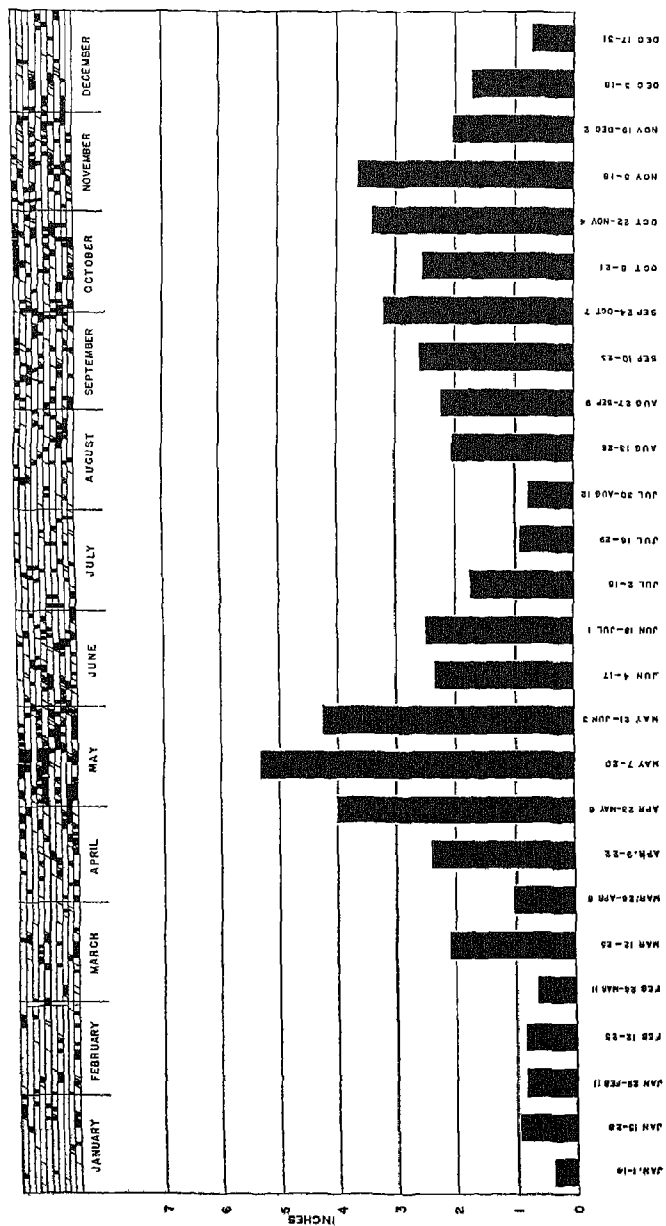
RAINFALL AT SAN JOSÉ DE LAS MATAS OVER 10-YEAR PERIOD (Yearly average 52.73 inches)



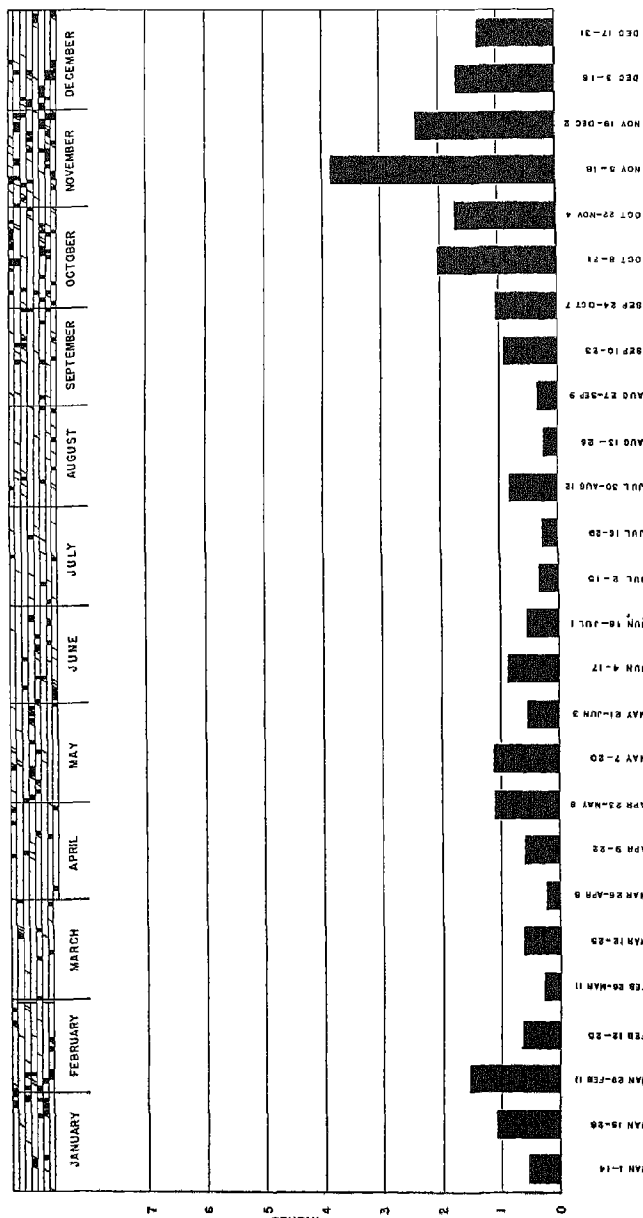
RAINFALL AT SAN JOSÉ DE OCOA OVER 10-YEAR PERIOD (Yearly average 44.47 inches)



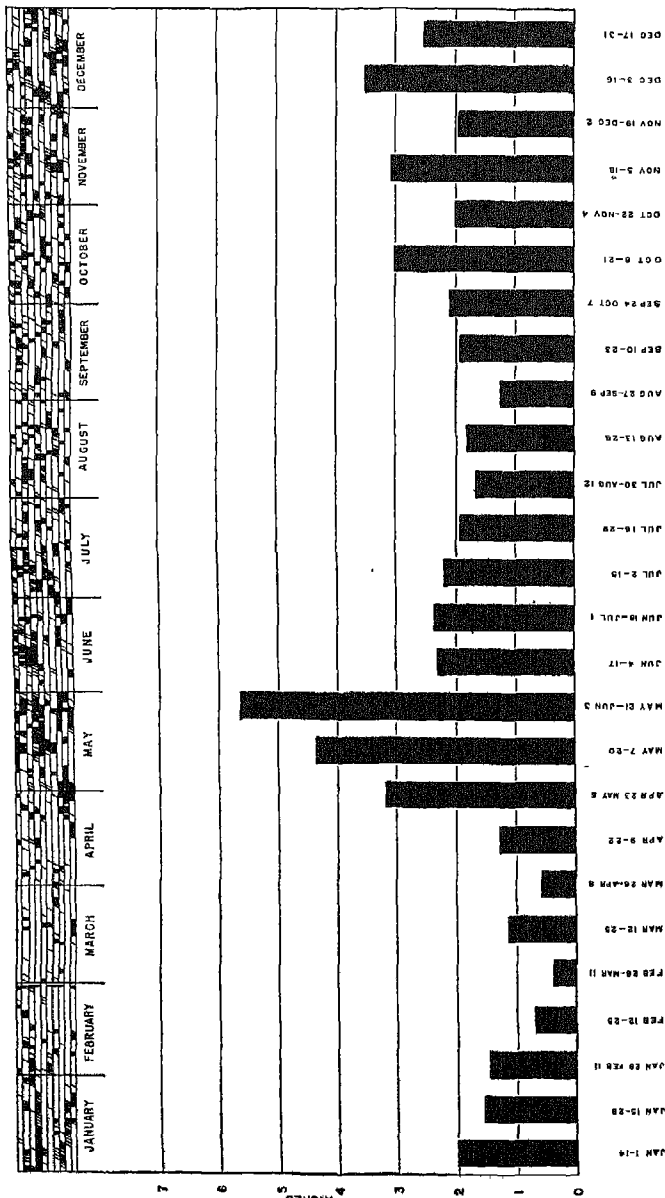
RAINFALL AT MONCIÓN OVER 10-YEAR PERIOD (Yearly average 55.41 inches)



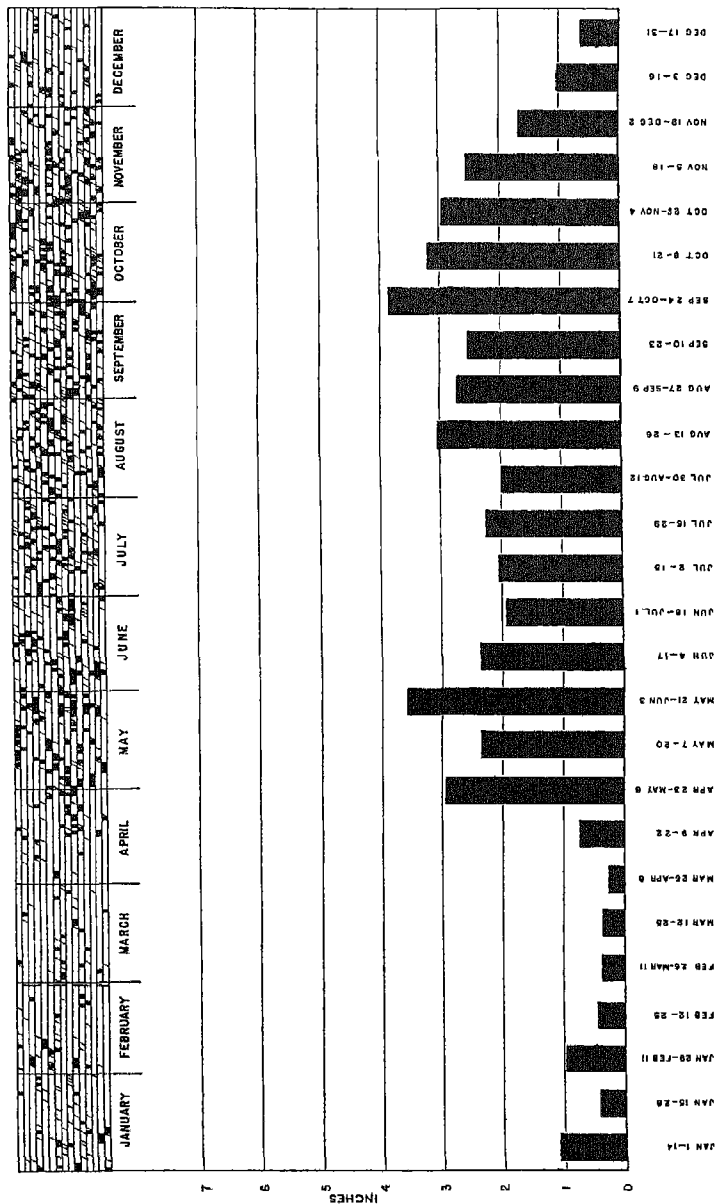
RAINFALL AT MONTE CRISTI OVER 7¼-YEAR PERIOD (Yearly average 26.74 inches)



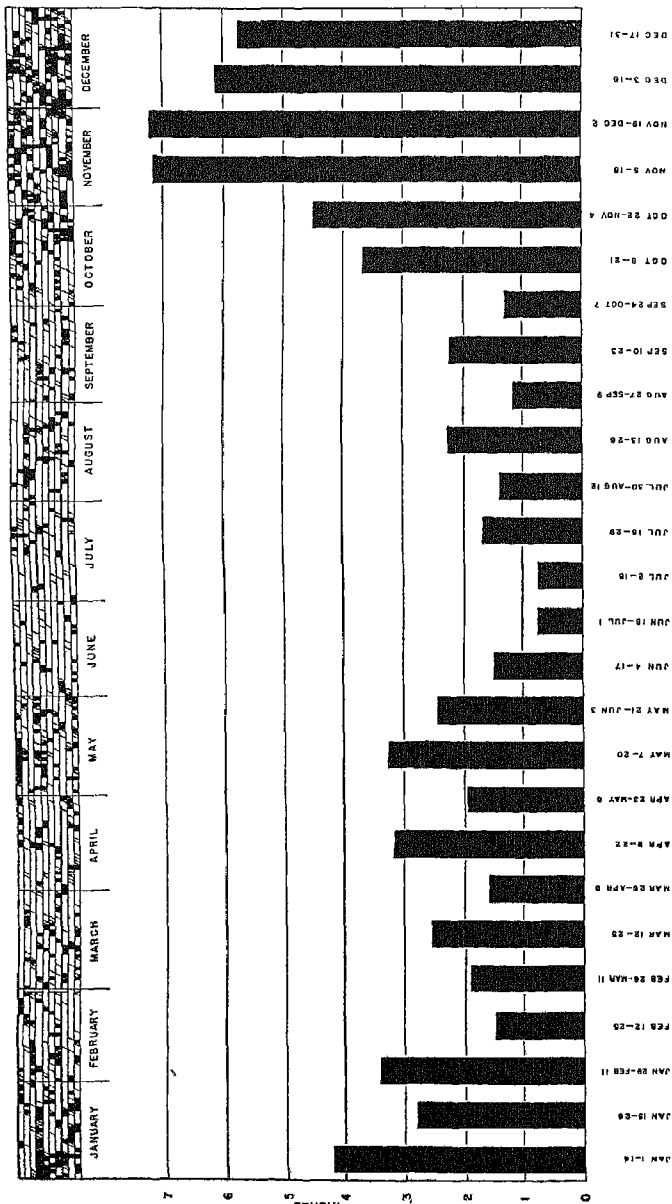
RAINFALL AT PIMENTEL OVER 10-YEAR PERIOD (Yearly average 56.20 inches)



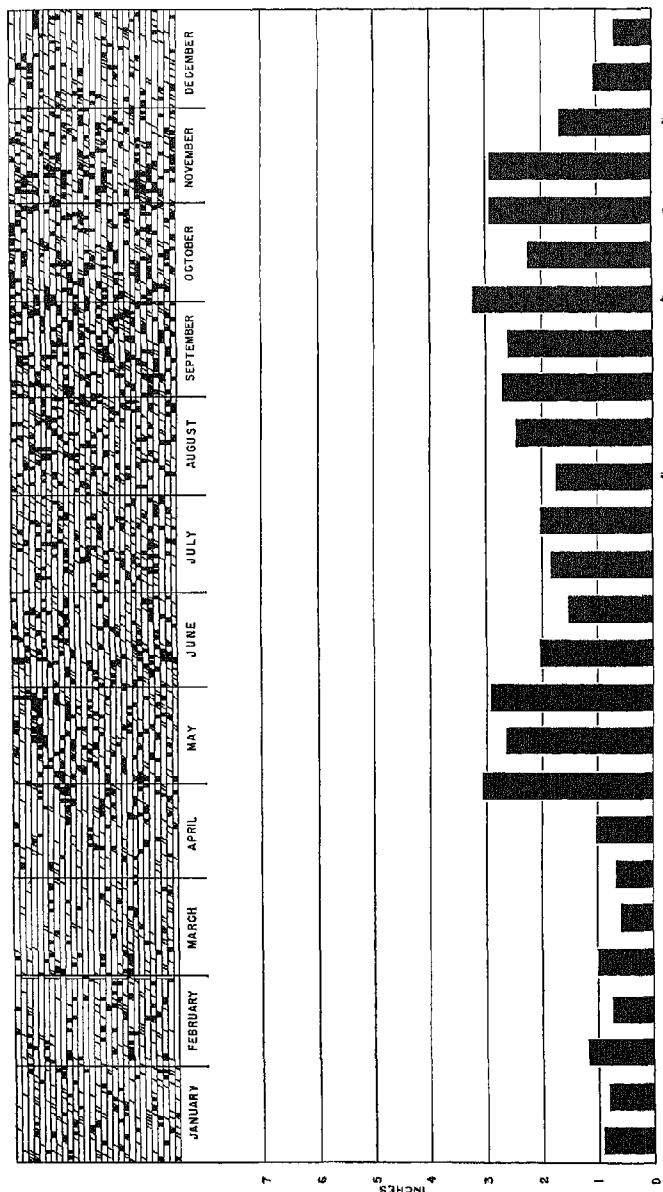
RAINFALL AT CENTRAL PORVENIR-BATEY OVER 15-YEAR PERIOD
(Yearly average 48.53 inches)



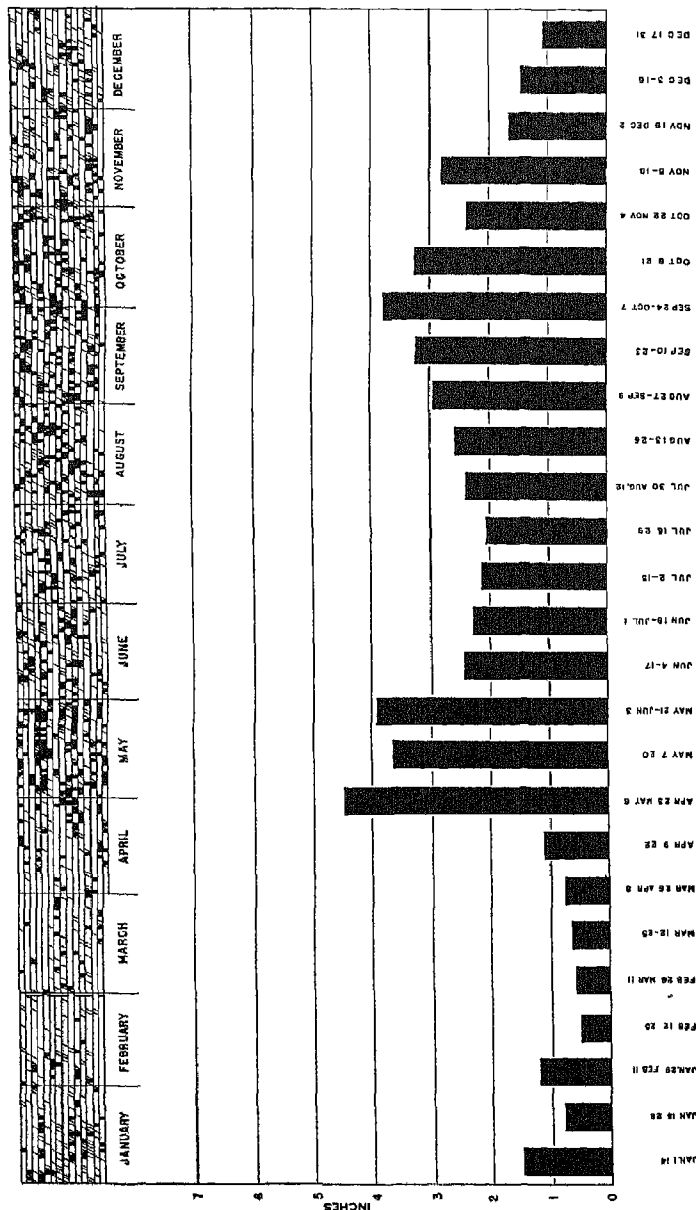
RAINFALL AT PUERTO PLATA OVER 10-YEAR PERIOD (Yearly average 76.36 inches)



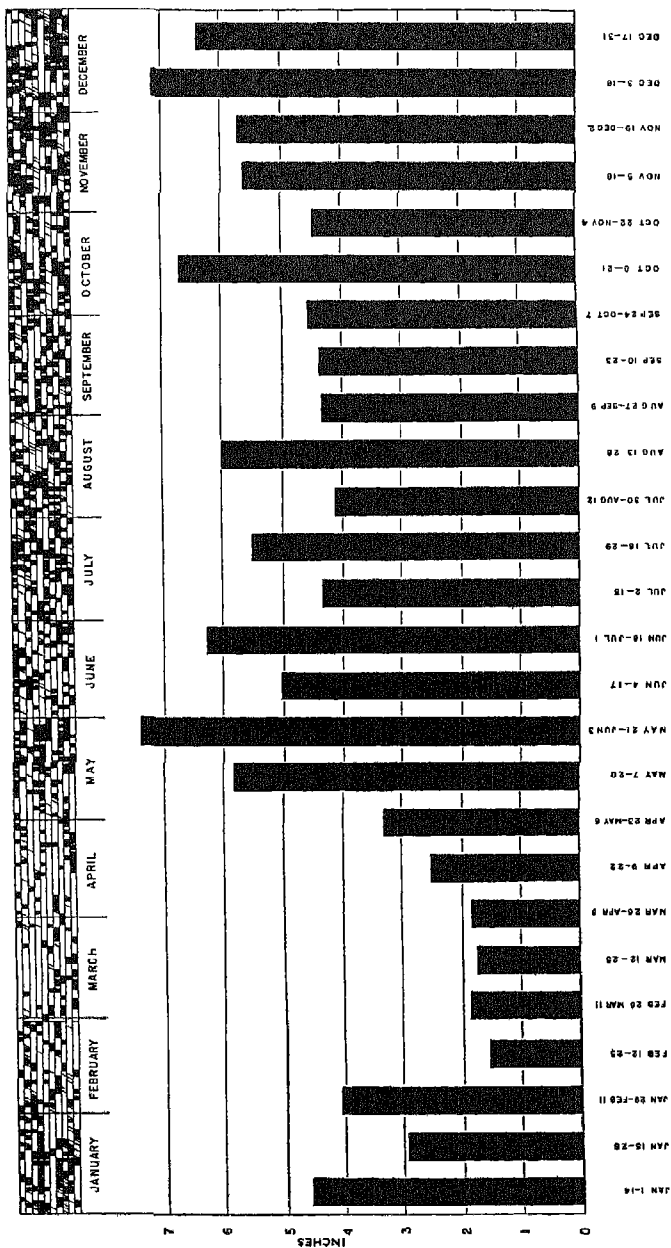
RAINFALL AT CENTRAL LA ROMANA-HIGUERAL OVER 29-YEAR PERIOD (Yearly average 47.34 inches)



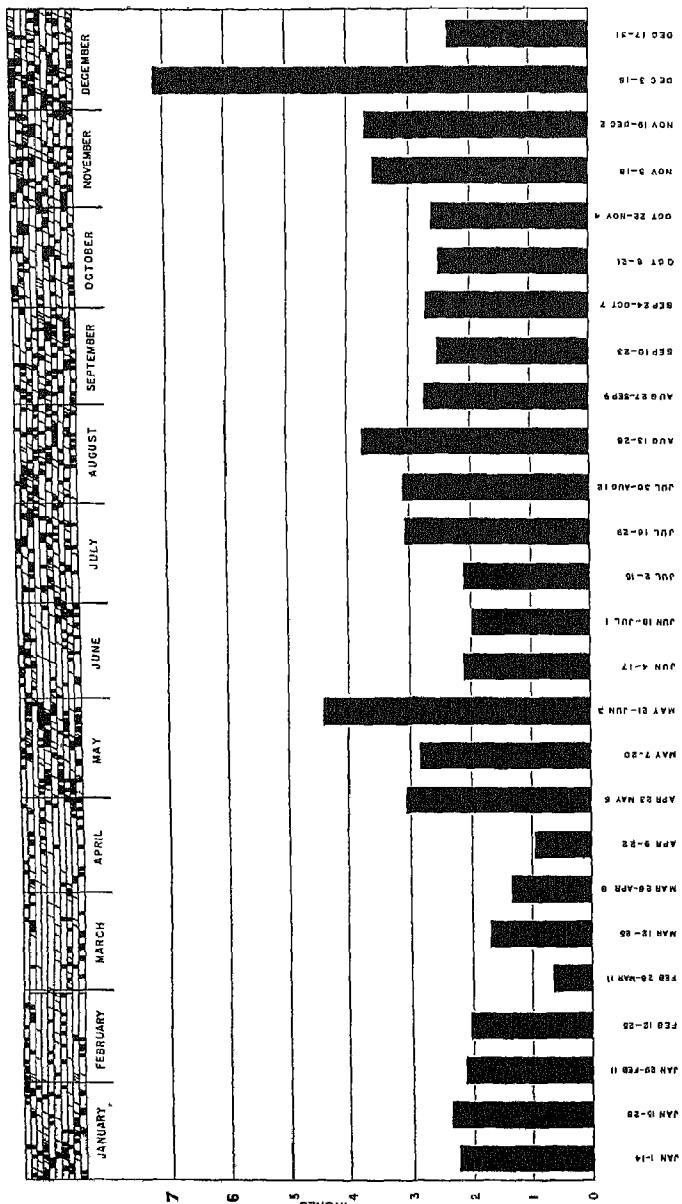
RAINFALL AT CENTRAL LA ROMANA-LA JINA OVER 15-YEAR PERIOD (Yearly average 55.71 inches)



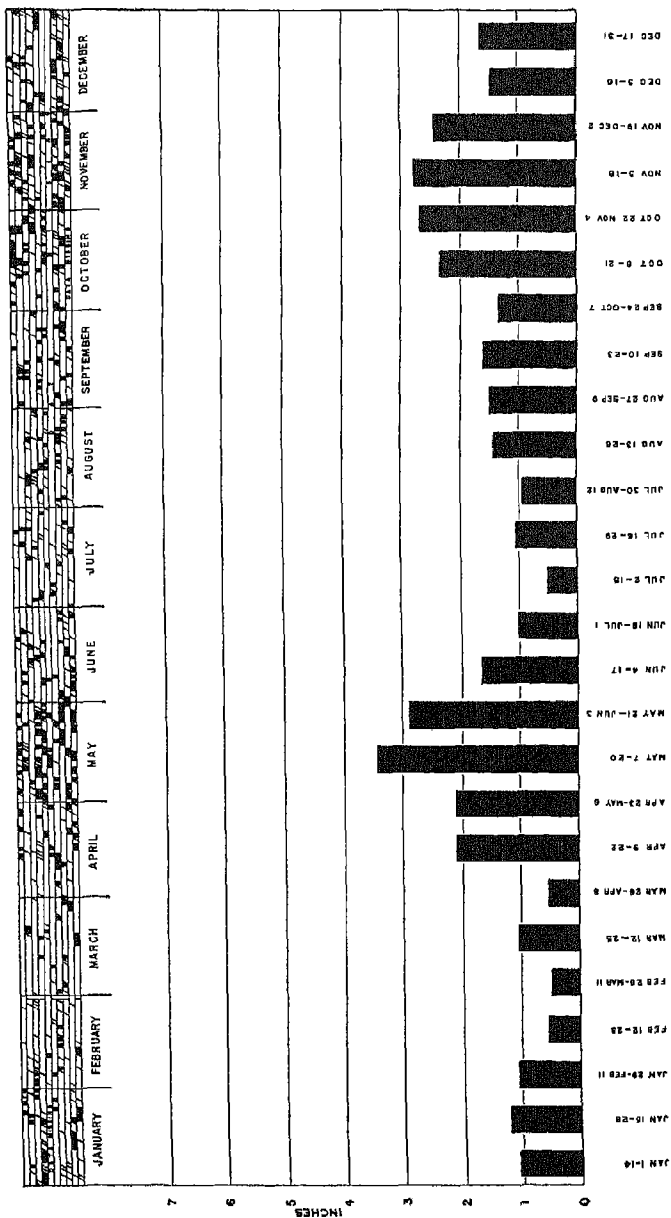
RAINFALL AT SAMANÁ OVER 10-YEAR PERIOD (Yearly average 118.44 inches)



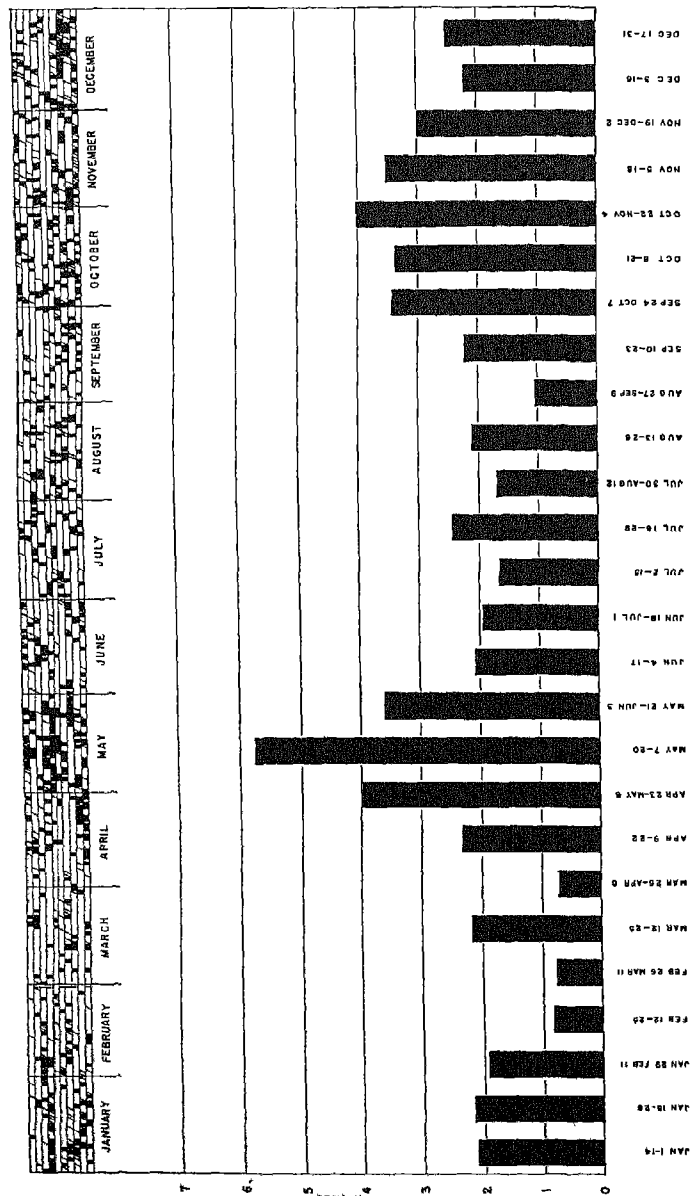
RAINFALL AT SÁNCHEZ OVER 10-YEAR PERIOD (Yearly average 72.15 inches)



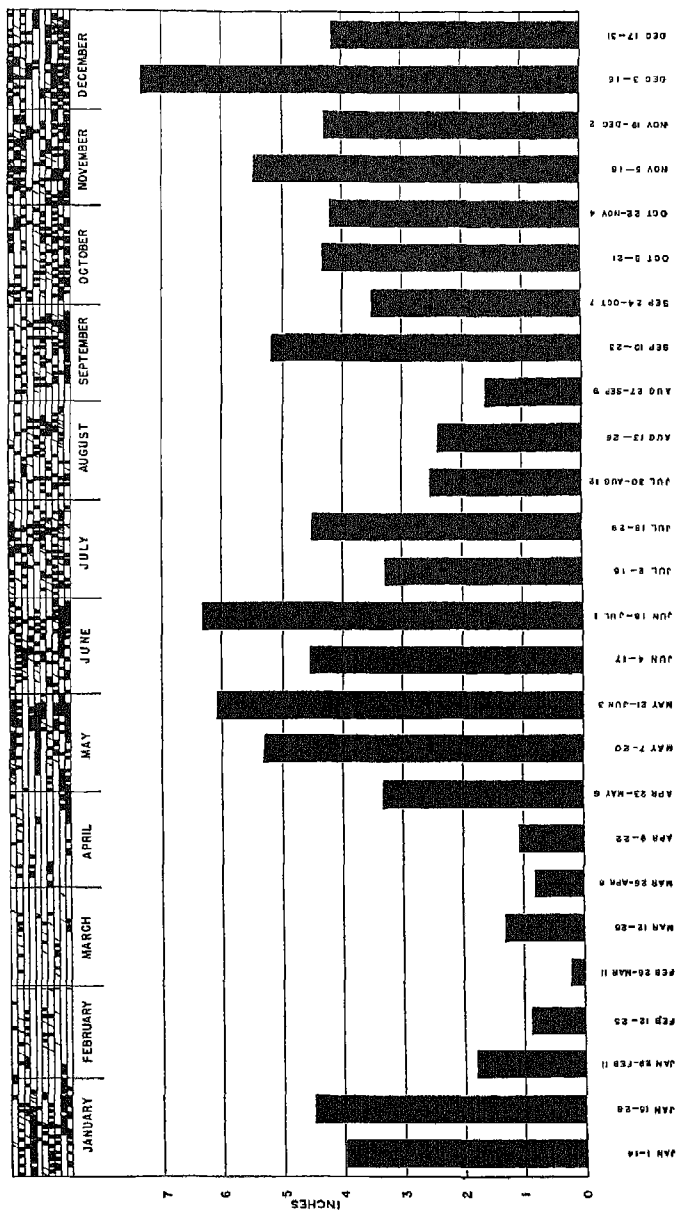
RAINFALL AT SANTIAGO OVER 10-YEAR PERIOD (Yearly average 41.20 inches)



RAINFALL AT LA VEGA OVER 10-YEAR PERIOD (Yearly average 63.73 inches)



RAINFALL AT VILLA RIVAS OVER 10-YEAR PERIOD (Yearly average 93.18 inches)



APPENDIX B

LEMON-GRASS OIL

According to reports of the Puerto Rico Experiment Station of the United States Department of Agriculture at Mayaguez, Puerto Rico, an annual production of 30 tons of lemon grass per acre, with an oil content of 0.3 per cent, has been obtained on unfertilized land on the station property. It seems likely that yields on the better lands of Sosua might approach those at Mayaguez though the rainfall expectancy is not as good.

After a new field of lemon grass has been planted, the first harvest can be expected in approximately six months. Later harvests can be expected at about three-month intervals. Lemon grass is a perennial and will grow indefinitely; however, to maintain a high yield, it must be replanted periodically at about three-year intervals. Cost of production of the grass would thus include the cost of planting material, land preparation, and periodic replanting, plus annual charges for taxes and interest on the land investment. These costs will vary with local conditions.

The cost of harvesting depends largely on wage scales, the degree of mechanization, and the type of land available. An annual production of 30 tons per acre would permit harvesting 7.5 tons every three months. Harvesting methods might vary from cutting by hand with a machete and loading with a fork, to cutting, chopping, and loading with a grass silage combine (a new machine in the final stages of development but not at present regularly offered for sale). Operation of the latter requires a small tractor. The choice of equipment depends on what is obtainable, on local wage scales and class of laborer obtainable, the kind of land available, and the acreage to be harvested. According to available information chopping increases the yield of oil and decreases the labor involved in handling the grass.

Because of the low oil content, the tonnages involved in the production of lemon-grass oil are very large, which makes it important to produce the grass as near the distillation plant as possible. The grass could be hauled on wagons drawn by horses or mules or on motor trucks.

The distillation plant is perhaps the limiting factor in the production of lemon-grass oil. Of prime importance in locating the plant are nearness to the grass fields and availability of an abundant supply of cool

water for the condenser. Plant costs include labor, fuel, maintenance, overhead, and cost of shipping containers for the oil. A wide variation in plant design is possible, ranging from a direct-fired, hand-loaded still with a simple pipe coil in a tube of water for a condenser to a more elaborate steam-heated unit with mechanical grass-handling equipment. Prices for a 500-gallon, tinned copper still were quoted in 1941 at the factory in New York at from \$1,200 to \$1,700, depending somewhat on the design of the still and on the manufacturer. Condensers were quoted at from \$300 to \$793. With crating, transportation, housing at the site, installation, and auxiliary equipment such as boiler, condenser water pump, and grass-handling equipment added, the cost of the plant with one 500-gallon still would be well over \$3,000.

The distillation process is the most expensive item in the cost of production. No cost figures on the process were available, but a theoretical calculation of the factors involved are presented below.

Two processes will be considered, one in which the grass is immersed in water and the heat is supplied by steam, the other in which the grass is placed in the still without water and steam is merely passed through the grass. In each case, a 1,000-gallon still will be considered. It will be assumed that one gallon of condensate is collected for each five gallons of still capacity, which appears to be common practice. Further assumptions will be that both grass and water supplies will be at a temperature of 82°F, that only 50 per cent of the heat supplied to the still is effective in heating its contents, and that the boiler efficiency is 70 per cent. Heat quantities calculated will be those required: (1) to raise the contents of the still from 82°F to the boiling point, (2) to evaporate the condensate, and (3) to raise the boiler make-up water from 82°F to the boiling point. Such items as heating-up costs, stand-by losses, and power for circulating condenser water vary so greatly with plant conditions and operation that they can only be mentioned as additional costs.

1. With the grass immersed, it is assumed that each gallon of still capacity will hold 2 pounds of grass and 0.7 gallon or 5.8 pounds of water.

$$1,000 \times 2 = 2,000 \text{ lbs. of grass per charge.}$$

$$1,000 \times 5.8 = 5,800 \text{ lbs. of water per charge.}$$

$$\text{Specific heat of grass, } 0.9 \text{ B. T. U. per lb. per degree Fahrenheit.}$$

$$2,000 \times 0.9 = 1,800 \text{ lbs., water equivalent of grass.}$$

$$5,800 + 1,800 = 7,600 \text{ lbs., water equivalent of still load.}$$

$$212^\circ - 82^\circ = 130^\circ\text{F, temperature rise.}$$

$$7,600 \times 130 = 988,000 \text{ B. T. U. per charge, theoretical heat required to raise still contents to boiling point.}$$

$988,000 \div 0.50 = 1,976,000$ B. T. U. per charge, practical heat required to raise still load to boiling point.

$1,000 \div 5 = 200$ gallons, or 1,660 pounds, condensate collected at 1 gallon of condensate per 5 gallons of still capacity.

$1,660 [(212^\circ - 82^\circ) + 970] = 1,826,000$ B. T. U. per charge to heat and evaporate condensate.

$1,976,000 + 1,826,000 = 3,802,000$ B. T. U. per charge, required in still.

$3,802,000 \div 970 = 3,920$ lbs. steam per charge required to heat still.

$3,920 (212^\circ - 82^\circ) = 509,600$ B. T. U. per charge to heat boiler make-up water.

$3,802,000 + 509,600 = 4,311,600$ B. T. U. per charge total heat required at boiler.

$4,311,600 \div 0.70 = 6,159,400$ B. T. U. per charge required in fuel.

$6,159,400 \div 12,000 = 513$ lbs. coal per charge or

$6,159,400 \div 5,700 = 1,080$ lbs. air-dried wood per charge.

Assuming an 80° rise in condenser water,

$1,826,000 \div 80 = 22,800$ lbs. or 2,750 gallons of condenser water per batch.

$2,000 \times .003 = 6$ lbs. of oil produced per batch.

2. With the grass not immersed, the calculations of heat required by this process are as follows:

$1,000 \times 2 = 2,000$ lbs. of grass per charge.

$2,000 \times 0.9 (212^\circ - 82^\circ) = 234,000$ B. T. U. per charge, theoretical heat required to heat charge.

$234,000 \div 0.50 = 468,000$ B. T. U. per charge, practical heat required to heat charge.

$1,000 \div 5 = 200$ gallons, 1,660 lbs., condensate collected per charge at 1 gallon condensate per 5 gallons still capacity.

$1,660 [(212^\circ - 82^\circ) + 970] = 1,826,000$ B. T. U. per charge to heat and evaporate condensate.

$468,000 + 1,826,000 = 2,294,000$ B. T. U. per batch required in the still.

$2,294,000 \div 970 = 2,365$ lbs. steam per charge required to heat still.

$2,365 (212^\circ - 82^\circ) = 307,450$ B. T. U. per charge required to heat boiler make-up water.

$2,294,000 + 307,450 = 2,601,450$ B. T. U. per charge, total heat required at boiler.

$2,601,450 \div 0.70 = 3,716,350$ B. T. U. per charge required in fuel.

$3,716,350 \div 12,000 = 310$ lbs. coal required or

$3,716,350 \div 5,700 = 652$ lbs. air-dried wood required per charge.

The condenser water required and the oil produced would obviously be the same as in the previous calculations.

These calculations are not intended to show a preference for either process but merely to indicate the very great quantities of heat required in both.

The Puerto Rico Experiment Station has been experimenting with the distillation processes of several essential oils. One of the innovations introduced is the use of salt in the distillation water. It is claimed that more efficient operation of the still can be obtained by this means and

that costs of operation can be reduced without lowering the quality of the oil. At first it was said that the salt solution could be used only once. A 2N solution of salt, or roughly 12 pounds of salt per 100 pounds of water, would require in the neighborhood of 117 pounds of salt per pound of oil distilled. More recent reports from the Puerto Rico Station indicate, however, that it is possible to re-use the distillation water containing salt as many as 10 or 12 times. If this can be done without lowering the quality of the oil and without incurring other disadvantages, it is likely that the process would be considerably more efficient than the use of unsalted water.

It must be emphasized, however, that the use of salt in the distillation process is still in an experimental stage, and, furthermore, that any discussion of distillation apparatus at this time loses much of its importance because equipment is not available. Production of lemon-grass oil at Sosua at this time will of necessity be carried out with whatever equipment can be procured.

If it were possible to obtain long-term contracts for the sale of oil at or near the current high price of about \$4.00 per pound, small plantings on land not included in subsistence planting plans might be worth trying. On the basis of small lay-outs and with the experience gained, some appraisal could be made of the suitability of this crop in the Sosua settlement program.

APPENDIX C

INDUSTRIAL OPPORTUNITIES

The discussion of Dominican industry in the pages which follow seeks not only to round out the general picture of the Republic's economy but also to give some idea of the extent to which refugee immigrants may hope to find employment in industrial undertakings. Both industries already well developed and those which seem to offer possibilities for expansion have been studied. Information was gathered from a variety of sources. Owing to the fact that Dominican official statistical agencies are chiefly of recent origin, much data had to be obtained elsewhere. The operation of important and representative industrial plants was studied first-hand, and much valuable material not available elsewhere was obtained on these visits. Among the sources of statistical material are the following: Oficina Central de Estadística Nacional; General Receiver of Dominican Customs; Director General de Aduanas; Director de Rentas Internas; Secretaria de Estado de Agricultura, Industria y Trabajo; the American Consulate at Ciudad Trujillo.

The cost figures given by the Bureau of Statistics, which are the best obtainable, include materials, wages, fuel, electricity, lubrication, containers, and packing, but do not include depreciation, repairs, replacement of tools, equipment and buildings,¹ interest on loans, taxes, and expenses involved in distribution. Nevertheless, the costs as given frequently are almost as great as total sales figures.

Some of the differences shown in comparing recent data with similar

¹ Building costs are comparatively low because wages are low. A bricklayer, for example, gets \$1.00 to \$1.50 for nine hours of work and a first-class carpenter \$1.50 to \$2.00, while unskilled laborers get not more than 50 to 60 cents. All concrete work is done by unskilled labor under the supervision of masons. The cost of houses and factory buildings is based on the floor area rather than the cubic content, as is usual in other countries. The building cost of a small, simple, one-floor factory made of reinforced concrete would amount in 1941 to \$23-24 per square meter, having risen from \$18-19 in 1938. The cost of a modern five-story office building in Ciudad Trujillo, completed in 1941, was approximately \$40 per square meter. The cost of modern two-story residences, with four to five bedrooms and the usual additional rooms, amounts to some \$25 per square meter. A modern luxurious four-story hotel cost \$60 per square meter for the actual hotel section, and \$30 per square meter for that part devoted to assembly halls, a restaurant, and a roof garden. The average price of cement per metric ton ranged from \$4.71 to \$9.33 in the ten years ending with 1939, reaching its highest figure in the last year.

data for previous years are due to more inclusive returns. Thus the figures for 1939 as a whole should be more representative than those for 1937.

I. MINERAL INDUSTRIES

Although mineral deposits have been reported in various parts of the country, the quantity is generally too small or the quality too poor for commercial development. Small deposits of high-grade iron ores exist, but iron production has not been profitable because of the lack of fuel. Gold, copper, salt, gypsum, and amber are exploited on a small scale. Native rock may be used successfully for cement manufacture, as discussed later.

The lack of statistical data was felt particularly in respect to minerals. The mineral resources of the Republic have not been adequately determined. The information given here was taken from both public and private reports. Because of lack of similarity among these reports, it appeared practical to present summaries of them separately rather than to attempt to work them into a unified whole.

A. The United States Geological Survey Report

The first geological survey of the Dominican Republic was made by the United States Geological Survey and was published in 1921. In so far as it dealt with economic geology, it was not encouraging. It showed 18 mining concessions in force in 1919, covering a considerable area, for the mining of gold, silver, manganese, copper, iron, nickel, and pyrites, and the extraction of petroleum.

Some gold existed in the gravels of many streams in the Cordillera Central, and veins containing gold were reported to exist at several places in this mountain range. One vein was developed near San Cristóbal. The copper deposits in the San Cristóbal district did not contain any large amount of gold.

No record of a successful working of silver mines was available.

Platinum was reported to have been found in the gravel of the Río Mao southwest of Santiago.

Deposits of nickel on Sierra Prieta, about 20 miles north of Ciudad Trujillo, were not promising. Although the top layers contained 1.29 to 3.01 per cent of nickel in the form of garnierite, the samples of the rock taken at a depth of 50 to 80 feet contained, with one exception, less than 0.4 per cent of nickel.

Copper ores were reported to occur in various places. For a long

time only the deposits of the San Cristóbal district had been worked and these intermittently. The main mines were located on the San Francisco Hill and on the Bucaro Hill. The copper content of the ore shipped from San Francisco amounted to 8.6 to 16.9 per cent, besides 1.3 to 2.8 ounces of silver and 0.01 to 0.1 ounces of gold per ton of 2,000 pounds. The ore is of two types: malachite and chalcopyrite. The survey found that some of the ore might be of sufficiently high grade to be worked on a small scale under favorable conditions, but expressed doubt that enough existed to be profitable on a commercial scale.

No iron mines were in operation. Laterite was found near Maimón and magnetite near Hatillo (Province of La Vega). Limonite was reported near Enriquillo and in the Sierra de Bahoruco, in the Province of Barahona in the southwestern part of the Republic. A sample of magnetite taken near Hatillo contained 66.35 per cent iron, but the survey, in the absence of more systematic prospecting, termed the Hatillo deposits as "of no commercial value at present." The possibilities of Maimón were not evaluated.

Manganese was reported to occur in different parts of the Republic but none was mined.

Very small quantities of lead were said to be present in some of the ore in the San Cristóbal district.

Oil had been found in small quantities near Azua in the southwestern part of the Republic at depths of 600 to 950 feet. This oil was dark brown, of high specific gravity (0.9309 at 60 degrees Fahrenheit), flash point 185 degrees Fahrenheit, fire test 220 degrees Centigrade, had an asphalt base, and contained no gasoline. Some possibilities of oil deposits at the plains of Neiba were indicated.

Lignite occurred in many places but in small and irregular masses only. No coal deposits were known.

Small deposits of lumps of amber existed in the vicinity of Peña in the Cordillera Septentrional, and pieces of amber had been found in stream gravels on the northwest border of the Cordillera Central.

Salt was mined at the north slope of Cerros de Sal near Las Salinas. Here salt occurs in lenticular masses in a gypseous stratum about 164 feet thick. The thickness of the lenses ranges from less than an inch to 20 or more feet, and few lenses are as much as 75 to 100 feet long. The salt, picked clean of shale, averages about 90 per cent sodium chloride, and it is said that it can be used without purification for refrigeration and similar technical purposes. Daily production of salt in 1939 was from 20 to 100 mule loads (of 70 to 80 kilograms). On the

coast, additional amounts of salt were obtained by the evaporation of sea water.

Gypsum in almost transparent plates was found to be abundant in Cerros de Sal.

Limestone was found in unlimited quantities. The impure limestone of the coastal plains is burned for making lime in many small plants near the towns.

B. Dominican Government Survey

In 1937 a new survey of natural resources, much of which dealt with minerals, was made for the Dominican government by Dr. Carlos E. Chardón and Howard A. Meyerhoff. The report is concerned especially with the possibilities of iron mine development.²

The iron industry was considered the most promising possible mineral development because of deposits of a high-grade ore on both sides of the Río Yuna between Piedra Blanca and Cotuí, near Hatillo, in the Province of La Vega, which are relatively accessible by highway, railroad, and water (by the Una River to Sánchez). The most advantageously placed deposits of magnetite (average composition 68.54 per cent iron, 1.28 per cent silicon dioxide, 0.507 per cent aluminum oxide, 0.157 per cent manganese, 0.20 per cent calcium oxide, 0.04 per cent titanium oxide, 0.024 per cent sulphur, and 0.04 per cent phosphorus) were estimated to be capable of a yearly production of 400,000 to 500,000 tons for a period of some 10 to 15 years. The Bethlehem Steel Company had expressed interest in these deposits, but no agreement with the Dominican government as to the exploitation of these mines seems to have been reached.

Small chromium deposits in Loma Peguera, between Piedra Blanca and Maimón, were not considered of economic interest. Further prospecting for nickel was recommended at Loma Peguera, and at reported deposits in the Provinces of Trujillo and La Vega. Prospecting for manganese also was suggested, indications of this ore being found in the mountains north of Tubano and in Buhuy in the Province of Azua, and west of Hato Mayor in the Province of Seibo.

Copper possibilities were seen around Algarroba on the Río Jaina in the Province of Trujillo, should the copper found there contain somewhat higher gold content to support the cost of mining. Río Nigua deposits were considered suitable only for small-scale operations when prices are high. They form two groups. The first, Bucaro, Cerro de

² *Reconocimiento* . . . (1937).

San Francisco, and La Rama, is situated 8 to 9 miles north of San Cristóbal on the Río Nigua; the second, some 3 miles farther is situated close to El Tablazo at the conjunction of Río Nigua and Majagual Creek. The most promising deposits not thoroughly explored were considered those in the District of Buhuy on the Río Yaque (Loma Tasa-jera 9 to 11 miles north of Buhuy, La Fortuna 12 to 15 miles north, and Canita 9 miles northeast).

Although some gold was determined in ore samples from various parts of the country, all actually produced was obtained from the rivers.

Caution was recommended with regard to oil drilling.

The report expressed the belief that lignite from the Cordillera Septentrional, although of poor quality, could be satisfactorily used in the manufacture of cement.

C. Mineral Information from Other Sources

A third important source of information on minerals is the report on the economic opportunities of the country published by the Dominican Department of Agriculture, Industry, and Labor in 1940. Some information may be found also in an article by Dr. Willy Lengweiler prepared for the Dominican exhibition of minerals at the New York World's Fair and reprinted in the *Revista de Agricultura* in 1939, under the title "Rocas y minerales de la República Dominicana." From these and other sources the following was learned:

The rock salt deposits in the Cerros de Sal, 9 miles long, are said to be inexhaustible. They are exploited by the Salinera Nacional. The same company, according to information obtained from its administrator, H. N. Hansard, is engaged in the production of salt from sea water in two places: on Calderas Bay, some 50 miles west of Ciudad Trujillo, and on a smaller scale at Salina Chica, about 12½ miles east of Monte Cristi.

Some chromium is to be found in Loma Caribe and Loma Peguera in the district of Monseñor Nouel.

Veins of garnierite with 13 to 15 per cent of nickel are found in Loma Peguera.

Deposits of manganese were located in Loma de los Guayuyos some 5 miles north of Bui in the Province of Azua.

A deposit of magnetite, the area of which was estimated at 1,000 acres, lies north of Bayaguana in the province of Monseñor de Meriño. Haematite is said to be abundant in numerous places. Some was found north of Los Llanos in the Province of San Pedro de Macorís.

Rocks most favorably situated for the manufacture of cement are to be found in Imbert, Province of Puerto Plata.

Copper is to be found close to Bahoruco and La Pipa in the Province of Barahona. Large deposits of copper are found on the northern slope of Culo de Maco on the border between the Provinces of Azua and La Vega.

There are indications of molybdenum in Arroyo Caballo, Province of Trujillo.

Garnets of quality sufficient for use as abrasives are said to be found in large quantities in the Balandra section, Commune of Samaná, Province of Samaná.

Asphalt is said to appear from time to time in great patches on the surface of the sea in Samaná Bay, Province of Seibo. Some asphalt was found at Higüey, Province of Seibo.

A somewhat larger deposit of lignite exists in Section Arroyo Barril, between La Gloria and Majagual.³

Some pyrite deposits are reported. Ochres and earths sometimes classified as kaolin are to be found at various places.

Large deposits of bat guano are said to exist in caves close to the seashore. This fertilizer is a source of phosphorus.

Amber of various shades occurs in small quantities in places close to Santiago (between Altamira and Canca, Province of Cibao), and is worked into artistic objects in Peña.

Gold is worked by large numbers of persons on practically all the rivers both north and south from the Cordillera Central, several hundred kilograms being obtained yearly. Annual exports are somewhat above \$250,000.⁴

Some mica is found in Monte Jicome, District San José de las Matas, Province of Santiago.

The presence of silver has been ascertained in samples from the San Cristóbal district.

Some nickel is reported in Villa Mella, Province of Monseñor de Meriño.

Iron is said to be present on the coast of the Provinces of Puerto Plata and Monte Cristi and on the beach close to Matanzas in the Province of Duarte. Indications of important deposits of iron ores are to be found in the Province Monseñor de Meriño.

³ A well-informed Dominican official has expressed doubt of the value of the lignite, asserting that its sulphur content is too high.

⁴ Gold is lately worked also on Río Isa and in July 1941 a 10¾-pound nugget was found in the Loma Cuchillas.

Concessions for petroleum drilling were given at Higuerito in the Province of Azua, Arroyo Blanco, Comendador, and Guanarate in Azua and Barahona, and Las Aguitas and Monte Cristi in Monte Cristi.

II. FUELS

Coal. As was stated above, no coal deposits have been found in the Republic. Very limited prospects are offered by small, as yet unexploited, deposits of impure lignite. Wood and charcoal are the only domestic solid fuels generally used, the latter being made by primitive methods in many parts of the country. A large-scale distillation of wood seems impractical, as the cost of distributing charcoal manufactured in a single plant would be prohibitive and the by-products (acetic acid, wood alcohol, acetone) under normal conditions cannot compete with the products obtained by modern syntheses.

The average price of one metric ton of coal as sold in the ports of the Republic has been as follows:

1930	\$ 4.19	1935	\$ 4.63
1931	3.37	1936	5.08
1932	2.72	1937	6.12
1933	3.56	1938	6.22
1934	4.28	1939	14.76

The imports of coal are relatively small, and in 1939 shrank to an almost negligible figure. Statistics for four years follow:

	Metric Tons	Value
1936 ^a	4,388	\$22,300
1937 ^a	2,584	15,818
1938	1,548	9,626
1939	119	1,763

Oil. Colonel John Whitney Lewis, Jr., of the Dominican Seaboard Oil Company, which is owned jointly by several large United States oil companies, was the source of information on oil drilling.

The Dominican Seaboard Company has obtained exploration permits covering more than 3,000,000 acres. Although drilling operations were suspended in June 1940, some 50 persons were engaged in 1941 in geological studies and in the aerial photography of districts of interest. Drilling machinery to the value of approximately \$250,000 was left in the country, and may be used after the geological project is completed.

Of the four wells drilled in 1939 and 1940, two (some 14 miles west of Azua) were not successful in striking oil. The other two

^a Including coal, coke, briquettes, and other fuels.

wells, less than 500 feet deep (in the Maleno Field about 5 miles from Azua) produced 18,000 barrels in ten months. One produced as much as 265 barrels a day on a half-inch choke, the other as much as 55 barrels a day. The oil has specific gravity 20 degrees API, 3 per cent of sulphur, and 5 to 9 per cent of lighter fractions. It could be used as fuel oil only where a high sulphur content is acceptable. The depth of the oil sands of Maleno is not known so far and the oil brought out is very gaseous.

It is necessary to import not only fuel oil but also gasoline, kerosene, and lubricating oils, inasmuch as there is no oil refinery in the Republic.

The imports and average prices of crude oil are given in the following table:

Year	Metric Tons Imported	Value of Imports	Average Selling Price per Metric Ton
1930	21,382.3	\$185,900	\$8.695
1931	30,076.0	206,100	6.853
1932	14,888.9	73,800	4.954
1933	34,570.0	170,300	4.927
1934	19,524.0	141,900	7.270
1935	26,104.2	173,400	6.642
1936	25,668.4	164,700	6.416
1937	24,970.9	157,400	6.304
1938	34,857.1	208,000	5.968
1939	26,140.3	135,000	5.165

III. ELECTRIC POWER

Government statistics present only a vague picture of the electric power industry. The Statistical Annual for 1939 supplies little information except as to capital investment in plant and equipment. According to this source there were 26 establishments, with a total investment of \$3,711,483.75, providing electric energy.

Statistics for 1939, obtained from unpublished material in the Dirección General de Estadística Nacional, are presented in the following table:

Establishments registered and reporting	28
Capital invested	\$3,483,000.75
Cost of fuel	\$85,907.35
Cost of lubricants	\$10,256.58
Wages	\$139,566.71
Number of employees	120
Number of laborers, including 5 apprentices	152
Production in kilowatt hours	23,118,729
Sales, in kilowatt hours	17,162,350
Average price per kilowatt hour sold	4.64 cents

The latest and most useful figures giving the production and sale of electricity are found in the *Annual Economic Review* by John Z. Williams, American Vice Consul at Ciudad Trujillo, dated February, 1941. According to Mr. Williams, the production and sales of the Compañía Eléctrica, which covers most of the country, were as follows (in kilowatt hours):

	1939	1940
Own production	12,317,431	13,031,702
From sugar mills	2,817,625	3,889,400
Sales: Domestic	3,016,680	3,372,001
Commercial	1,686,824	1,937,813
Industrial	3,604,884	3,869,605
Street	1,303,297	1,229,052
Other municipal	550,388	630,107

The grand total for all plants, amounting to 20,135,056 kilowatt hours in 1939 and 21,921,102 in 1940, was estimated by Mr. Williams by adding 5,000,000 kilowatt hours to the production given in the table above.

Steam or Diesel motors are used. In Ciudad Trujillo the Compañía Eléctrica uses oil under steam boilers. Elsewhere it uses Diesel engines.

According to Mr. Williams, two potential hydroelectric power sites offer promise, but their development would be uneconomical in the absence of industrial expansion. The sites are Jimenoa Falls near Jaramba in the geographical center of the country, with a capacity of some 10,000 kilowatts, and the upper reaches of the Yaque del Norte in the northern section of the country, with a capacity of some 1,000 kilowatts.

The Dominican Department of Agriculture estimates of potential hydroelectric production are much more optimistic. They are given below, in thousands of kilowatts:

Río Nizao	35
" Jaina	5
" Yuna	7
" Yaque del Norte	25
" " Sur	25
Other rivers	15

Location of electric plants. The Compañía Eléctrica de Santo Domingo owns and operates plants as follows:

Plant	Capacity (In kilowatts)
Ciudad Trujillo	7,410
San Pedro de Macoris	1,210
Puerto Plata	1,000
Santiago	560
La Vega	120
	10,300

The figures given here take into consideration an 80 per cent power factor in spite of the fact that at night the power factor rises to some 90 per cent.

The only other fairly large electric plant supplying public needs is the privately owned plant at San Francisco de Macoris (200-300 kilowatts). Other plants have a capacity of not more than 25 to 50 kilowatts each, and none could supply industrial power without the installation of new equipment.

Four sugar centrals are electrically driven by power from their own plants, utilizing bagasse, the sugar cane waste, as fuel. During their milling season of 5 to 7 months they produce a considerable excess of power above their own needs, and three mills use this excess to repay "in kind" to the Compañía Eléctrica the electric energy supplied by this company during the mills' inactive season. The exchange of electric power between the sugar mills and the Compañía Eléctrica requires special equipment and transmission lines, and the fourth electrified sugar mill is not so equipped. The volume of power which could be furnished by sugar mills to new industries during the milling season has not been investigated but might be sufficient to take care of considerable demand.

The starch mill of the Compañía Agrícola Dominicana at Quinigua, in the vicinity of Santiago, has a large electric plant estimated at some 1,000 kilowatts. Both Diesel motors and a steam generator are installed, and the electric plant is well loaded during a milling season covering some 11 months. During the twelfth month, the entire plant is overhauled, and the starch mill depends for electric power on the Santiago plant of the Compañía Eléctrica.

Voltage and transmission lines. The Compañía Eléctrica generates alternating current of 2,300 volts and 60 cycles, which is distributed to the cities and transformed to 110 and 220 volts. The high voltage current is recommended for larger industrial uses. The company owns two transmission lines (33,000 volts). One leads toward the three sugar mills (Ciudad Trujillo to La Romana, with short side lines to Boca Chica

and other places) and the other starts in La Vega and follows, in general, the road to Moca, Santiago, and Puerto Plata.

Power rates and wages paid. The rates given here are those of the Compañía Eléctrica. They may be considered constant except in the case of a considerable rise in the price of fuel.

To enterprisers with motors up to a total of 10 horsepower, the rates are: first 50 kilowatt hours, 10 cents; next 100, 8 cents; next 350, 7 cents; all additional, 6 cents. Minimum monthly charge is \$1.00 per horsepower at full load, but not less than \$2.00.

To enterprisers with motors over 10 horsepower: first 5,000 kilowatt hours, 5 cents; additional 5,000, 4.5 cents. The minimum monthly charge is \$1.00 per horsepower as above, but not less than \$12.00 a month.

To very large consumers, a fixed monthly charge of \$2.00 for each horsepower of the connected full load plus 4 cents each for the first 100 kilowatt hours; 3 cents each kilowatt hour for an additional 1,000; 2 cents for the next 10,000; and 1.5 cents for anything over 11,000. These large consumers are allowed to pay the power rate also for energy used by them for light (light rates being higher) if light consumption does not exceed 10 per cent of the current used for power.

Common labor is paid 60 cents; semi-skilled labor, 80 cents; mechanics, \$1.50 to \$2.50 per 8-hour day. There are three shifts of 8 hours each. The wages paid in provincial towns are somewhat lower than those paid in the capital.

IV. INDUSTRIES BASED ON LOCAL RAW MATERIALS^a

Among the industries discussed in this section are gypsum, cement, turpentine, meat canning, leather manufacturing, food products, and home industries. Some of these require substantial capital investment, while others could be started with relatively low cost.

Gypsum. Gypsum of good quality, found in large deposits in Cerros de Sal, contains on the average 78 per cent calcium sulphate, and only 0.3 per cent ferric oxide. It is exported to Puerto Rico. With cheap fuel it could be partially calcined and made into pressed tile and wall-board, or fully calcined and converted into plaster of Paris. These products are used extensively in the building industry and their manufacture requires only simple technological processes.

^a Rock salt and sea salt are not mentioned here, although they were considered as a potential base for industrial development, because their production would not be of interest to colonists or refugees.

Cement. No cement is produced in the Dominican Republic. The annual imports of this basic building material, and their values, are given in the following table, which is based on data found in *Estudio Estadístico*.

Year	Metric Tons	Value	Year	Metric Tons	Value
1920	20,037	\$412,300	1930	18,849	\$171,000
1921	16,528	360,600	1931	17,212	132,400
1922	11,732	188,300	1932	10,357	60,900
1923	16,071	220,600	1933	13,939	76,400
1924	18,482	243,000	1934	16,231	93,700
1925	17,594	170,600	1935	21,054	112,800
1926	21,115	220,000	1936	24,986	117,600
1927	28,403	282,700	1937	32,838	158,700
1928	30,147	272,800	1938	15,939	107,600
1929	36,480	296,600	1939	28,912	269,900

Manufacture of cement on the north coast may be feasible if easily accessible lignite deposits of satisfactory quality can be found in that section. Suitable rock is available at Imbert.

The Department of Agriculture, Industry, and Labor visualizes the eventual establishment of a cement plant using Dominican oil as fuel, somewhere on the border of the Provinces of Barahona and Azua. The outcome depends, however, on a favorable result of an analysis now being made of certain earths. There is an ample supply of gypsum, which is essential in cement manufacture.

The establishment of this industry involves such a large capital that those who would consider cement manufacture in the Republic should undertake the necessary technological, transportation, market, and other exploration on the spot.

Resins and turpentine oil. The development of a small-scale resin and turpentine industry would seem to offer promise, although figures which would serve as a completely reliable guide to actual possibilities are not obtainable. Pine trees grow in considerable abundance. Chardón estimates the pine growth in the Dominican Republic as "7,200 square kilometers in the Cordillera Central and 300 square kilometers in the Sierra de Bahoruca." The same estimate places the number of pine trees at 72,000,000, valued at \$43,200,000. Some other estimates have been much lower. The Department of Agriculture reported three licenses for the tapping of pines in effect in the summer of 1941.

According to the "Resúmen del Movimiento Industrial" for 1939, there were only two establishments, employing two laborers, in the resin and turpentine industry. The investment amounted to \$950; cost of

materials, \$3,510.02; wages, \$714.41; and sales, \$6,421. Output comprised the following:

Oil of turpentine	2,005	gallons
Tar	2,300	"
Resin	57,380	kilograms
Pitch	1,055	"
Soft pitch	170	"

Cost represented 72 per cent of sales. Investment for one job amounted to \$475.00 and the wage per laborer, \$357.20. This wage is relatively very high, inasmuch as the daily wage of a laborer in the manufacture of charcoal is said to amount to 10 to 20 cents. In 1939, exports of pitch and resin were 8,768 kilograms (\$1,485); in 1940, 26,502 kilograms (\$10,190).

The Department of Agriculture figures for 1940 give the value of imported resin and turpentine oil as \$24,000. Thus there appears to be room for some development of this industry for domestic use, regardless of export possibilities. Considerable additional quantities of resin could be used in the manufacture of good laundry soaps which are now made from imported oils and fats.

Data on the yields of turpentine tapping in the Dominican Republic are somewhat confusing. Complaints have been made to the Department of Agriculture that under the present regulations 1,000 trees yield only 5 gallons of turpentine a month, about one-third the yield of the United States. This may be an inaccurate figure, or it may reflect the results of strict laws controlling tapping, which is regulated by the Department of Agriculture in the interest of forest conservation.

Tests made in the vicinity of Monción in the Province of Monte Cristi, using the drastic method of "boxing" for turpentine, are reported to have produced approximately 9 barrels of turpentine, yielding 45 gallons of turpentine oil, and 22½ quintals of resin, from 10,000 trees in six days. Another test produced 10 barrels of turpentine, or 50 gallons of turpentine oil, and 25 quintals of resin, from 12,000 trees in six days.

An instance of success in a small-scale turpentine business was provided some time ago by a Finnish refugee, one of a group that had failed to earn a living in rice culture. He went to the woods around Jarabacoa, built equipment for the distillation of resinous pine stump wood, and now runs one charge every 48 hours, getting 15 to 20 gallons of pitch and 5 gallons of turpentine oil per charge. In 1940, one gallon of the pitch brought 25 cents.

The tapping and collecting season extends from February to November. The "face" of the tree is renewed in from 8 to 12 days, and from one to two pounds of turpentine are obtained from each face. In 1940, turpentine oil was worth 70 cents per gallon, and resin from 4½ to 5 cents per pound, in Ciudad Trujillo.

Meat canning. Dominican statistics on preserved meat do not relate to corned beef or other types of canned meats, but to sausages, smoked hams, lard, dried meat, and salted meat in barrels. These products are generally prepared and marketed in a primitive way, and little change can be expected until a modern abattoir is provided, refrigeration facilities are substantially increased, and transportation is greatly improved. An abattoir is being built at Ciudad Trujillo.

Statistics for 1939 are given below:

Establishments registered	6
Establishments reporting	5
Capital invested	\$54,450.00
Number of employees ¹	10
Number of laborers	43
Wages	\$9,807.29
Total costs	\$77,527.00
Production, in kilograms	221,809
Sales, in kilograms	217,728
Value of products sold	\$77,893.59
Costs as percentage of sales	99.5
Capital investment per job	\$1,010.00
Annual sales per job	\$1,470.00
Average annual wage	\$185.00

In these totals, production of lard amounts to 32,274 kilograms; sales, 26,044 kilograms; and value of sales, \$8,001.45.

Exports of "carne en conservas" in 1939 and 1940 were as follows:

	1939		1940	
	Kilo-grams	Dollars	Kilo-grams	Dollars
Beef (salted or in brine) . . . . .	...	...	397	60
Pork " " " "	6,253	772	2,014	163
Sausages	1,266	408	798	286
Lard	135	44	129	37

In the modern plant of Brugal & Company, in Puerto Plata, from 10 to 15 hogs are killed per day. The products are salt pork, smoked hams, and semi-dried and dried sausages. This plant is sufficiently equipped with cold storage and has four smoking chambers. The smoked

¹ Includes salaried employees: office, administrative, foremen, etc.

sausages are dried for 45 days in large shaded rooms, the walls of which are made of wide-mesh screen for protection against rodents. Flies and other insects will not touch the pre-dried and well-smoked sausages, so no protection against them is necessary. Native wood is used for smoking.

Leather manufacturing. The *Tañería Santa Barbara*, with a capital of \$40,000 invested in one large and one small plant, is the largest leather manufacturer in the country. There are 75 workers in the larger plant, where calf skins and goatskins are tanned. Both vegetable (local divi-divi and mangrove bark with some imported quebracho extract) and chrome tanning are normally conducted. Chrome tanning has been considerably reduced because of the priorities in effect on chromium and chromium salts in the United States, the source of supply. Domestic cattle hides of kip size are made into sole, saddle, and heavy upper leather. Goat skins are chiefly made into leather for lining, only a few going into real upper leather. The daily wage amounts to 60 to 70 cents, the foreman receiving from \$1.50 to \$2.00.

Hides and skins are not properly obtained, and considerable improvement is to be expected with the industrialization of cattle killing. Ticks reduce the value of skins. The upper leather produced locally is distinctly below the imported qualities. Formerly some was exported, but the market now is entirely domestic. A good opportunity for production of higher qualities of upper leather would seem to be offered if modern manufacturing processes could be adjusted to tropical conditions. Although this is not an insoluble problem, it would call for the services of an expert tanning chemist and considerable experimentation.

In 1936 only four tanneries had machine equipment. Later figures on this point are not available. Statistics on leather making and marketing are given in the following table:

	1937	1938	1939
Establishments registered	26	24	22
Establishments reporting	17	21	19
Capital invested	\$32,621.00	\$86,569.84	\$90,000.00
Wages	\$20,146.47	\$22,587.50	\$22,647.94
Total costs	\$176,908.24	\$167,554.63	\$170,527.83
Production, in kilograms	486,321	497,593	557,210
Sales, in kilograms	452,546	447,408	519,232
Value of products sold	\$215,734.38	\$194,782.27	\$199,292.11
Costs as percentage of sales	82	86.5	85.5
Number of employees	6	8	7
Number of laborers, including apprentices	86	98	97
Capital investment per job	\$355.00	\$815.00	\$865.00

	1937	1938	1939
Annual wages per job	\$207.00	\$191.00	\$195.00
Value of products sold per job	\$2,340.00	\$1,950.00	\$1,910.00
Imports, in kilograms	81,012	66,367	79,427
Value of imports	\$226,383.00	\$167,792.00	\$211,167.00
Exports of cattle hides, in kilograms ^a . .	897,693	649,807	445,480
Value of cattle hides, exported ^a	\$194,655.00	\$83,302.00	\$54,900.00
Exports of goat skins, in kilograms ^a . .	136,161	125,956	126,200
Value of goat skins, exported ^a	\$73,404.00	\$40,125.00	\$40,306.00
Exports of leather, in kilograms ^a . . .	33,172	58,913	—
Value of leather, exported ^a	\$16,196.00	\$25,136.00	—

Milk products. Statistics relating to cheese manufacture, taken from several sources, are given in the following table:

	1937	1938	1939
Establishments registered	13	40	100
Establishments reporting	88	83	70
Capital invested	\$40,000.00	\$62,523.50	\$62,500.00
Wages	\$9,360.00	\$11,208.83	\$10,485.14
Total costs	\$80,188.69	\$106,904.79	\$108,324.66
Production, in kilograms	481,511	441,468	465,293
Sales, in kilograms	473,211	408,488	436,881
Value of products sold	\$82,375.60	\$109,618.86	\$121,596.36
Costs as percentage of sales	97.3	97.3	88.5
Number of employees	53	56	52
Number of laborers, including apprentices	39	48	45
Capital investment per job	\$438.00	\$600.00	\$645.00
Average annual wage	\$103.00	\$107.00	\$109.00
Annual sales per job	\$900.00	\$1,050.00	\$1,250.00
Imports, in kilograms	8,990	10,976	40,357
Value of imports	\$4,404.00	\$5,701.00	\$11,748.00
Exports, in kilograms	8,531	8,778	2,182
Value of exports	\$1,805.00	\$1,929.00	\$504.00

Recently large interests, using good feeds, have entered the dairy and cheese industry, and presumably will develop it to a greater extent than in the past. Such development, however, would not appear to preclude success by European colonists familiar with making special varieties.

The following table presents official and other statistics in the production of butter and margarine. Separate figures for each commodity were obtainable only in part:

^a In 1940 exports were as follows: cattle hides, 401,600 kilograms valued at \$49,694; goat skins, 111,613 kilograms valued at \$31,257; leather, 112 kilograms valued at \$300.

	1937	1938	1939
Establishments registered (with machines)	5	6	17
Establishments reporting	10	14	14
Capital invested	\$32,171.50	\$54,571.50	\$54,500.00
Wages	\$7,075.70	\$7,652.86	\$8,172.94
Total costs	\$75,413.01	\$65,659.57	\$81,698.06
Production of butter, in kilograms	91,084	83,328	94,481
Sales of butter, in kilograms	90,021	84,422	98,320
Value of butter sold	\$76,263.68	\$69,882.89	\$80,219.43
Production of margarine, in kilograms	74,110	69,197	87,893
Sales of margarine, in kilograms	74,110	69,197	87,893
Value of margarine sold	\$35,631.25	\$26,696.25	\$33,609.75
Total sales	\$111,894.93	\$96,579.14	\$113,829.18
Costs as percentage of sales	81.5	86.5	83
Number of employees	12	14	13
Number of laborers, including apprentices	18	25	20
Capital investment per job	\$1,072.00	\$1,400.00	\$1,650.00
Average annual wage	\$236.00	\$196.00	\$247.00
Average sales per job	\$3,730.00	2,480.00	\$3,440.00
Average price of butter sold, per kilogram	\$0.8475	\$0.8275	\$0.8150
Average price of margarine sold, per kilogram	\$0.48	\$0.386	\$0.322
Imports of butter, in kilograms	5,738	4,797	6,137
Value of imports of butter	\$3,522.00	\$3,071.00	\$4,061.00

Government figures place the value of annual imports of condensed milk and milk powder at \$25,000. These represent the total consumption, as there is no home industry of this type. The erection of a cheese and butter plant, which would also manufacture condensed milk, on the Duey River close to Higüey in the Province of Seibo, was begun in 1941.

The average yield of milk cows in the Republic is only 2 liters per day. This low yield makes it unlikely that the development of the evaporated milk industry can be economically justified. Since the yield even from imported milk cows of higher type rapidly decreases, a substantial and permanent improvement in this respect is improbable.

In 1937 the butter and margarine industry used only 10 per cent of imported raw materials; in 1938 it worked exclusively with domestic materials; in 1939, imported materials amounted to 29 per cent. The imported raw materials are for margarine manufacture.

The plant of Brugal & Company of Puerto Plata, which was visited, uses some 4,000 liters of milk a day, producing butter, pasteurized milk, and several kinds of cheese. It is equipped with cold storage facilities for the ripening and storing of cheese. The least perishable of the types

produced is similar to Dutch Edam, covered in the final stage of manufacture with a red paraffin layer.

Fish. Official statistics giving the weight (in pounds) of fish brought to the harbors during 1939 and 1940 follow:

Harbor	1939	1940
La Romana	143,609	54,910
San Pedro de Macorís	117,220	104,965
Las Calderas	125,046	156,619
Sábana de Mar & Samaná	93,824	95,733
Other harbors	251,648	503,613
Total	731,347	915,840

The quantities of principal species caught in 1940 are given below, in pounds:

Colorado (<i>Lutianus vivanus</i>)	77,000
Carite or carita (<i>Scomheromorus maculatus</i>) ⁹	41,000
Cojibuda or cojinuda (<i>Caranx chrysos</i>)	63,000
Robalo (<i>Centropomus undecimalis</i>)	51,000
Mero (<i>Epinephelus morio</i>) ¹⁰	54,000
Rayado or arrayado (<i>Haemulon parra</i>)	49,000
Bermejuelo	38,000

A considerable amount of salted and otherwise preserved fish is imported, but the production of smoked fish seems to offer the chief possibility of profit to colonists. This industry can be started on a small scale and does not require expensive equipment. Some smoked fish is consumed in the Republic. Such a product has the advantage of not requiring relatively expensive containers.

Imports of smoked herring and other fish, chiefly from Canada and Norway, are given below:

	Amount (In tons)	Value
1936	54.5	\$31,879
1937	80.8	54,912
1938	62.4	46,152
1939	64.0	40,001

The sale of fish livers as a source of vitamins offers possibilities for profit. The livers of some 57 fish species (tuna, mackerel, shark, swordfish, seabass, etc.) are now used, and the price of sorted livers at New York in July 1941 averaged from 30 to 78 cents per pound, according to the kind of fish. Unsorted livers on New York or Boston markets

⁹ 5-6 feet long; very good; not bony.

¹⁰ 2-3 feet long; very good.

brought about 25 cents per pound. There is every prospect for maintenance and even improvement of the demand in the United States.

The usual method of marketing fish liver for export from Japan requires freezing the livers in 45-pound cans. Importers will gladly accept liver preserved in Aquacide, however. Ten pounds of Aquacide powder at 10 cents per pound will preserve 100 pounds of fresh livers. This chemical is extensively used in South America, South Africa, and other places.

Should the fish industry develop, salting of some fish and extraction of other fish oils for industrial purposes might be added. Export of fish meal appears impracticable because of humidity conditions which would not permit the production of meal with a 6 per cent moisture content.

Chocolate and candy manufacture. Production statistics for three years follow:

	1937	1938	1939
Enterprises registered (chocolate factories)	89	87	77
Enterprises reporting	48	77	56
Wages	\$9,632.80	\$13,393.57	\$12,950.74
Capital invested	\$13,773.94	\$25,040.89	\$29,209.00
Domestic raw and other materials	\$54,552.34	\$52,384.71	\$66,261.67
Production, in kilograms	710,751	579,784	681,156
Sales, in kilograms	708,352	583,811	680,707
Value of product	\$84,709.99	\$93,717.91	\$106,584.23
Number of employees, all classes	261	217	110
Total costs	\$71,495.89	\$75,505.22	\$88,456.09
Costs as percentage of sales	84.5	80.5	83.5
Annual sales per employee	\$325.00	\$430.00	\$960.00
Capital investment per employee	\$52.50	\$115.00	\$265.00
Value of exports . . . . .	...	...	\$6,525.00
Average annual wage	\$37.00	\$61.50	\$118.00

According to customhouse statistics, imports of cacao in 1938 were 14,626 kilograms, valued at \$3,900; 11,553 kilograms in 1939, valued at \$2,806; and 155 kilograms in 1940, valued at \$100.

In 1939 there were 19 establishments making candy and confectionery, with 56 employes and a capital investment of \$7,291. Many of these establishments made chocolate also. The retail price of chocolate in Ciudad Trujillo in 1939 was 10 cents a pound.

The exports of chocolate in 1940 amounted to 57,361 kilograms with a value of \$10,886. Only one exporter, Cortés Hermanos of Ciudad Trujillo, is on the official list. This plant is a small establishment working below its full capacity. It has only one unit of each essential piece of equipment, and productive efficiency is low. The most expensive single piece of machinery is a rather small cacao butter press made in New York. Dominican cacao and sugar, both refined and

crude, are used exclusively. Chocolate containing 35 per cent cacao is made for local consumption. Chocolate with a 40 per cent cacao content is made for export, chiefly to Puerto Rico. The company also produces chocolate candy in cellophane, which is sold in boxes.

Personnel of the plant includes 70 to 80 laborers and 7 or 8 other employees. The annual production and sales figures are not disclosed. The minimum average amount of cacao used monthly was given as 100 quintals. The working day is 8 hours. The wages of most of the workers amount to 30 to 50 cents, but a few specialists get as much as \$1.00 a day. Repairs are made by outside mechanics and engineers.

Home industries. Home industries and rural crafts produce important quantities of such commodities as household utensils, straw hats, lime, charcoal, and pack animal equipment. Preliminary data from the 1940 farm census gave the following totals for the number of these articles produced:

Harness and other equipment for animals:	
Harness	59,048
Straw bags	111,206
Cordage (for tethers, halters, etc.) of majagua ¹¹	405,644
Sisal cordage ¹¹	310,443
Coarse bags (<i>serones</i>) of woven rushes	135,292
Household equipment:	
Brooms	427,766
Plain chairs	90,844
Rocking chairs	29,806
Pottery for cooking	115,981
Water jars	42,131
Miscellaneous:	
Straw hats (dozen)	31,710
Lime (barrels)	141,014
Charcoal (barrels)	1,499,123

It is estimated from data for average retail prices of these articles that annual production should be valued at a minimum of \$700,000; and making a reasonable allowance for omissions, it appears that the sum of \$1,000,000 fairly represents the value of home-industry production.

The wages earned in home industry could not be learned, but must be assumed to be considerably lower than those paid by other industries.

V. INDUSTRIES TO PRODUCE GOODS NOW IMPORTED

Fiber containers and cotton textiles are two important classes of imports which might possibly be produced advantageously in the Republic.

¹¹ A length of about 6 feet.

Containers. Statistics on the value of containers used by Dominican industry are given in the following table:

	1937	1938	1939
Total value of containers (including glass, porcelain, paper, etc.)	\$992,300	\$938,100	\$1,191,100
Value of domestic container production	\$51,200	\$88,000	\$121,900
Domestic containers, value as percentage of all containers	5.16	0.38	10.3
Value of jute bags	\$440,269	\$510,081	\$486,359
Jute bags, value as percentage of the value of all containers	44.4	54.3	40.8

Jute bags, normally imported from India, are used chiefly in the sugar and coffee industries. Considerable difficulty has been experienced in obtaining supplies since the outbreak of the war. No domestic substitute has been produced, although experimental work is being carried on. Sisal has been considered by several students as the most feasible substitute, as it is grown in Haiti and elsewhere in the Caribbean area, and production probably could be increased. It is, however, a hard fiber, and is not suitable for yarns of the softness used in jute bags. The threads, because of their clean surface, would have to be fine and woven very closely should the sacks be used for fine materials. The hard character of the fiber also makes handling by stevedores difficult, as the threads cut into the flesh. Research is now being conducted at the Mellon Institute, at Pittsburgh, seeking a method of softening the fibers without affecting their other properties.

Attempts are being made also to develop a yarn using sisal with coir (coconut fiber) which would be stronger and more resistant to rot. While it appears doubtful that these objectives would be achieved by the combination, bags more suitable for the packing of fine products such as sugar might be made. Coir is not produced in the Republic.

Cabuya, growing chiefly on the northeast shores of the country and in the Province of Santiago, yields a sisal-like fiber which is used to make rope, binder twine, hand bags, hats, and other similar small objects. Cabuya is used in Colombia to make bags. These bags have more or less the same unpleasant effects on the shoulders of the stevedores as those made of sisal, and the existence of this industry in Colombia is made possible by a high tariff protection against jute. In Venezuela, cabuya bags are sewed from a fabric woven on primitive hand looms.

The Dominican Department of Agriculture hopes to replace jute bags by serones made from strips of the leaves of the guano palm

(*Coccothrinax argentea* Sarg) which grows in the Dominican Republic in abundance. Guano serones are generally used for saddle bags for the transportation of almost any product. They are wear-resistant and strong. It may be pointed out, however, that the substitution of a palm leaf mat for a jute fabric would certainly cause serious difficulties in the handling of sugar cargo, and there might be opposition to containers woven where the usual sanitary standards are not observed.

Another idea that has been advanced is the possibility of extracting fiber from the stems (trunks) of plantains and bananas after the fruits are harvested. It seems unlikely, however, that this can be done. Abaca, the best cordage fiber in the world, is obtained from a plant of the genus *Musa* which would not produce edible fruits and which is cut down before full flowering. So far as could be learned, the growing of jute (*Corchorus capsularis* and *C. olitorius*) has never been tried in the Dominican Republic or elsewhere in the West Indies.

Textiles. Local production of cotton textiles, which are by far the outstanding group of all the goods imported, might be considered a field for absorption of European immigrants. Development of this industry might make possible lower prices to consumers. The industry, however, would require a considerable investment of capital, and could probably flourish only under a high protective tariff. There is little reason to suppose that immigrant labor in a textile factory would command higher wages than are now paid to Dominican labor in similar establishments. For these and other reasons, it would seem inadvisable to contemplate the establishment of a textile industry without a very careful examination of all the factors involved.

VI. LOCAL AND SPECIAL INDUSTRIES

This section deals with industries which, because of special local circumstances or experience and training of the colonists, may offer some opportunity for development. Included are bakeries, soft drink manufacturing, shirts and underwear, leather manufacturing, canning and preserving, and the making of art objects and souvenirs. Bread, because of its character and the limited development of transportation, must be made in numerous establishments serving local areas. Soft drink bottling is now concentrated in a few plants, but local manufacture of various soft drinks may offer some opportunity to colonists as new territories are developed. Many of the colonists have asserted a knowledge of sewing, tailoring, shoe-making, and other skills such as might be utilized in other industries discussed.

Bakeries. The largest Dominican bakery, the Panadería Quico, in Ciudad Trujillo, employs 88 laborers and 34 other employees. The plant is in constant production, 7 days a week and 24 hours a day. It uses 15,000 bags (196 pounds each) of United States flour a year, and 40 gallons of United States lard a day. The products include the usual types of white and whole wheat bread, as well as bread products for special Dominican demand, and some types of simple pastry. Quico uses three American, two French, and two locally made ovens. Mixing and kneading of dough is done by machines; the rest of the process by hand.

In 1937 only 29 bakeries used machines. For later years no adequate data on this point are available. Other data for the industry are given in the table below.

	1937	1938	1939
Establishments registered	193	209	204
Establishments reporting	134	187	154
Capital invested	\$350,950.00	\$400,500.00	\$355,403.60
Value of domestic materials used	\$32,319.86	\$35,258.44	\$37,024.75
Value of foreign materials used	\$393,141.69	\$407,918.94	\$380,276.01
Total costs	\$533,917.83	\$564,724.59	\$539,834.32
Production, in kilograms	2,578,930	2,733,997	3,138,948
Sales, in kilograms	2,552,717	2,723,727	3,123,896
Value of product	\$566,188.22	\$650,930.36	\$704,906.72
Cost as percentage of sales	94	86.5	77.0
Number of employees	248	209	141
Number of laborers	394	427	304
Capital investment per job	\$550.00	\$630.00	\$795.00
Average annual wage	\$142.00	\$160.00	\$235.00
Annual sales per job	\$885.00	\$1,020.00	\$1,560.00

The wage scheme in the Quico bakery differs from that of any other industry studied. The owner pays to the Secretary of the Bakery Workers' Union \$3.30 per bag of flour put into production. The Secretary calls each day at the plant and distributes the money among the workers according to the hours worked. The owner of the factory does not keep records of the workers and does not determine the wages paid for various jobs. The laborers work 6 to 12 hours a day, according to their desire for income.

The minimum wage in bakeries of San Pedro de Macorís and Santiago is regulated by two decrees of the President of the Republic. These decrees also base the wages on payment of \$3.30 for every bag of flour used. No less than five workers must be engaged in an establishment using from one to two bags of flour a day, and proportionally more

workers must be employed when the flour used exceeds two bags. The wages must be paid in cash directly to the workers, according to a fixed scale. The owner of a bakery must not discharge any worker without permission of the Department of Labor.

Soft drinks. Statistics of the soft drink industry are shown in the following table:

	1937	1938	1939
Establishments registered	12	12	10
Establishments reporting	11	12	10
Capital invested	\$14,888.36	\$20,547.57	\$20,000.00
Wages	\$2,560.13	\$4,335.77	\$3,514.72
Total costs	\$25,436.85	\$38,233.22	\$84,122.82
Quantity produced, in liters	345,996	501,256	841,844
Quantity sold, in liters	343,450	494,991	840,081
Value of sales	\$44,095.51	\$57,111.38	\$89,092.81
Cost, as percentage of sales	57.7	62.0	94.5
Number of employees	9	15	24
Number of laborers	11	18	12
Capital investment per job	\$745.00	\$622.00	\$555.00
Average annual wage	\$128.00	\$131.00	\$97.50
Annual sales per job	\$2,205.00	\$1,730.00	\$2,470.00

Shirts and underwear. Two shirt and underwear factories in Ciudad Trujillo, La Americana and Gonzales and Company, were visited. One employed 16 seamstresses and had machines for about 50; the other engaged about 50 seamstresses, with mechanical equipment for all.

Making of men's shirts and underwear is one of the very few industries to which minimum wages apply. The wages are based on the making of a dozen articles such as shirts, pants, underwear, blankets, caps, and mosquito nets. The wage for a dozen ordinary shirts amounts to 50 to 55 cents, for better quality shirts 72 cents, 85 cents, \$1.00, \$1.05, \$1.20 and \$1.45; for first-class cotton shirts, \$1.35 and \$1.65; and for silk shirts, \$4.10. The wage for making a dozen undershirts is 10 and 19 cents. The various single operations into which the making of an article is divided are paid according to special detailed tariffs. Minimum wages here, as in the other three industries paying minimum wages, are the actual wages. When paid this minimum wage, a very good seamstress may earn as much as \$4.50 to \$5.50 a week of 44 hours. The usual wage, however, is 50 to 60 cents for an 8-hour day.

The factories visited use Singer sewing machines and cutting machines made in the United States. Both plants also make pajamas and union

suits of fair quality, sold at prices which are high compared with those in the United States.

One plant was engaged in knitting men's socks and anklets (cotton and rayon) on some 20 circular knitting machines of United States make. It had a small drum for laundering and dyeing, and, for the final shaping, some 20 aluminum steam-heated "legs" were installed. The few men employed in the finishing of socks and in the inspection of knitting work 5½ days a week on an 8-hour day basis and earn not more than \$1.00 per day. The apprentices get \$2.00 for a full week.

The table which follows presents statistics of the shirt and underwear industry in 1937-39. The costs given as compared with sales are rather high, and in 1938 they exceeded the sales, although the stock on hand at the end of 1938 was not greatly in excess of the usual amount. As to average investment per worker, the 1939 figure represents the situation more accurately than those for 1937 and 1938.

	1937	1938	1939
Establishments registered	35	35	32
Establishments reporting	22	31	27
Capital invested	\$150,455.30	\$166,135.19	\$37,619.68
Wages	\$44,777.09	\$42,928.73	\$40,986.77
Total costs	\$197,562.39	\$273,596.29	\$250,101.92
Shirts produced, in dozens	35,537	38,541	34,149
Shirts sold, in dozens	31,652	35,531	32,763
Value of shirts sold	\$198,571.39	\$223,896.38	\$228,690.52
Underwear produced, in dozens	14,334	19,991	16,971
Underwear sold, in dozens	13,089	17,135	16,471
Value of underwear sold	\$31,480.98	\$43,576.47	\$42,593.27
Value of products sold	\$230,052.37	\$267,472.85	\$271,283.79
Cost as percentage of sales	86	110.7	92.5
Number of employees	25	40	40
Number of laborers, including apprentices	315	380	325
Capital investment per job	\$443.00	\$395.00	\$102.50
Average annual wages	\$130.50	\$102.50	\$115.00
Annual sales per job	\$667.00	\$588.00	\$742.00

The making of standard shirts and underwear appears to offer little opportunity for immigrant enterprise, as this industry is well established and no need for expansion is felt. Seamstresses among the colonists would have to turn their attention to better-quality dresses, both ready-made and made-to-order.

Men's clothing. Costs in the men's clothing industry are somewhat lower in relation to sales prices than in the shirt and underwear industry. The average wage and the value of the worker's yearly output is very low. Statistics of this industry are presented below.

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	1937	1938	1939
Establishments registered	147	157	184
Establishments reporting	149	158	169
Capital invested	\$62,780.60	\$64,788.73	\$65,856.73
Wages	\$52,378.21	\$52,843.80	\$58,836.38
Total costs	\$220,486.83	\$220,494.47	\$252,366.07
Value of product	\$345,976.57	\$321,593.72	\$319,491.92
Costs as percentage of sales	63.7	68.8	79.0
Number of employees	33	61	25
Number of laborers, including apprentices	412	409	403
Capital investment per job	\$141.00	\$138.00	\$163.00
Average annual wage	\$118.00	\$112.00	\$146.00
Annual sales per job	\$780.00	\$685.00	\$792.00
Detail of production and sales:			
Drill suits of cloth:			
Pieces produced	25,361	24,767	23,911
Pieces sold	25,361	24,226	22,821
Value of suits sold	\$143,035.65	\$135,397.57	\$129,730.68
Drill pants:			
Pieces produced	133,807	57,709	50,840
Pieces sold	133,807	59,338	43,893
Value of pants sold	\$64,826.70	\$49,153.30	\$38,448.18
Value of imports of cotton clothing, except knit goods	\$26,355.00	\$31,134.00	\$29,267.00

Leather shoe manufacture. The following table presents statistics on shoe manufacture for 1937-39:

	1937	1938	1939
Establishments registered	231	250	192
Establishments reporting	123	170	161
Capital invested	\$224,253.10	\$275,315.63	\$277,100.00
Wages	\$150,191.89	\$142,842.47	\$148,014.72
Total costs	\$500,463.59	\$537,149.01	\$575,998.80
Domestic materials used as percentage of total	40.0	38.2	37.6
Total sales	\$593,781.67	\$601,505.52	\$607,104.14
Costs as percentage of sales	84.5	89.5	95.0
Number of employees	68	141	48
Number of laborers	1,329	2,132	951
Average annual wage	\$122.00	\$62.70	\$148.00
Annual sales per job	\$425.00	\$264.00	\$607.00
Capital investment per job	\$160.00	\$121.00	\$277.00
Men's shoes sold	126,371	154,466	158,725
Value of men's shoes sold ¹²		\$303,848.79	\$318,802.37
Women's shoes sold	189,801	163,448	177,834
Value of women's shoes sold ¹²		\$212,695.02	\$223,588.32
Children's shoes sold	75,588	89,595	108,777
Value of children's shoes sold ¹²		\$74,462.84	\$60,656.89
Value of babies' and other shoes sold ¹²		\$10,498.87	\$4,056.56

¹² The value of all shoes in 1937 was \$593,781.67.

Of the 231 establishments registered in 1937, only 3 had machines. Figures for later years are not available.

The largest Dominican shoe factory is the Fábrica Dominicana de Calzado ("Fadoc") in Ciudad Trujillo, with a capital of \$100,000. This plant has been in operation 34 years. It employs normally about 130 persons and makes from 300 to 350 pairs of shoes a day. The maximum number of people employed at any time is 200, turning out some 500 pairs a day. All but three or four of the employees are unskilled, most of them men. Farmers' shoes of heavy brown leather, retailing at \$3.75 to \$4.00, and black patent leather shoes for ladies are the principal products. Soles of men's heavy shoes are fastened with brass nails, and heels with steel nails.

The sole and middle-sole leather, and considerable quantities of heavy upper leather, are Dominican-made. Few native goatskin shoes were found in the stock. The wooden heels for ladies' shoes are made in Santiago. The remainder of raw and auxiliary materials are now imported almost exclusively from the United States. The cost of native brown heavy upper leather is 18 cents per square foot, and the same leather imported from the United States costs 22 to 28 cents. The price of native goatskins, with holes and many dark spots, is 12 to 13 cents per square foot.

This plant has always used shoe machinery. With the exception of a few German machines, the manufacturing equipment was obtained in the United States, and the shoe repair machinery is also of United States origin.

The wages of the shoe industry are fixed by a decree which orders minimum wages for cutting, preparing, lasting, and finishing of different types of shoes for men, women, and children. The wage categories are based on simplicity or complexity of the design and structure of the shoe, and on whether production is manual or mechanical. The actual wages paid for an 8-hour day are as follows: expert workers on shoe machinery, \$2.00-\$3.00; cutters, \$2.50; preparatory work, \$1.50-\$1.75; other work in which no machines are used, \$1.00-\$1.25; women in unskilled jobs, 40-70 cents, except sewing, for which payment is by the piece. The average for all workers of Fadoc is \$1.75 to \$2.00.

Fruit preserves. Despite the abundance of papayas, mangos, bananas, oranges, limes, pineapples, coconuts, guavas, and other fruits, and the presence of large sugar plants, there is no fruit-preserving industry. In 1939 there was one small establishment making fruit juices, with a

yearly output valued at \$224. Imports of fruit preserves and marmalades in 1940 are estimated at \$7,000.

Some rather stiff guava jelly is made in the "dulcerías" which manufacture the native sweets, and orange peel is sold, preserved in sugar syrup, but no data are available on the production of either. Guava jelly, in small bricks covered with cellophane, is peddled by boys in the larger towns. In 1939 exports amounted to 503 kilograms valued at \$80, but in 1940 they dropped to 80 kilograms, valued at \$13.

The chief difficulties in the way of the preserving industry are lack of expert knowledge, lack of local fuel, and the dependence on foreign countries for cans and jars. Development of the canning industry seems improbable because of the difficulty in getting or making cans. The production of fairly thick preserves containing a large proportion of sugar and packed in paraffined paper containers might be tried.

Preserved vegetables. Making of preserved pickles and green tomatoes was tried by a few Sosua settlers in the spring of 1941. Little market can be expected, however, in the Republic, which grows vegetables in abundance, and where few are able to buy imported canned products. The buying power of the masses may be illustrated by the fact that it is not unusual to shop for one cent's worth of vinegar or cigarettes.

One vegetable preserve which might nevertheless have some chance for success is tomato concentrate of the type of the Italian "pasta di pomidori." This, packed in small sterilized cans, was formerly imported in large quantity from Italy and found a ready market. The manufacture of tomato paste should be seriously considered by those who have a surplus of tomatoes, and a cheap source of heat such as flue gases, for evaporation, but the problem of obtaining satisfactory containers must first be solved.

Objects of art and souvenirs. Although a number of stores specialize in "native" handicraft products of various types and several schools teach manual crafts, relatively few souvenir objects are made locally. Considerable attention has been given, however, to the development of *industria criolla*, chiefly producing ladies' bags, hats, and slippers from local fibers (*cabuya*), and belts, figurines, necklaces, bracelets, etc., from seeds. Interest in these products is being awakened and developed, and commercial production and marketing is being organized with an eye to the United States market. There have been the usual difficulties incident to the development of a new home industry. When large orders for the United States are obtained, the supply is likely to be insufficient, and additional goods cannot be made within the period of time specified

in the order. Chinese and Japanese products have offered difficult competition on cheap products, such as straw slippers.

Objects made of old mahogany, laboriously finished by hand, are undersold by peddlers with varnished wares whose sales to tourists undermine the reputation of Dominican mahogany goods, and may further reduce the possibilities in this field.

Practically no embroidery is made in the Republic. A few objects of needlework (wall panels) are done by a few well-to-do women more as a hobby than as means to obtain income.

Objects made from small shells have recently been turned out in small quantities. Alabaster (gypsum), coconut shells, garnets, and wooden beads are completely neglected. No toys are made at the present time, and some which were made of fiber were of such a character that toy-collectors exhibited them as examples of barbarous taste and primitive development. No pocket cigaret cases or cigarette holders are made from wood or exotic leather; no silver bracelets, for which the neighboring Haiti is well known, are made; and no home textiles are woven.

Many objects of art and curios are imported into the Dominican Republic from various Central and South American countries. This seems to be one field which could be developed relatively easily by people with artistic talent and training.

VII. EXISTING INDUSTRIES OFFERING LITTLE OPPORTUNITY TO COLONISTS

The industries discussed in this section must be given consideration even though the conclusion is that they offer little or no opportunity to colonists. The country's leading industry, sugar, is not touched upon, inasmuch as it is treated fully elsewhere.

Starch. The Compañía Agrícola Dominicana at Quinigua, some 5 kilometers west of Santiago, is the sole manufacturer of starch, producing tapioca flour from yuca tubers. This company, with a capital of \$2,000,000, started its development in 1934. It owns a large area on which 4,000 small farmers grow yuca, and it also purchases the tubers from independent growers, who are encouraged to plant this relatively new crop on a larger scale. The output of tapioca flour is gradually increasing, and in 1941 was estimated to be about 12,500 metric tons, compared with 5,448 in 1939.

The equipment is modern, based on the experience of similar organizations in the United States. The company has its own electric plant, powered by two Diesel motors of German make. The 250 workers are employed in two shifts of 12 hours. Under normal conditions the

plant runs six days a week, but recently it has been operating only five days, owing to the necessity of shutting down to clean the motors because of the poor quality of oil. Most workers are paid 4 to 5 cents per hour. Those who have more responsible jobs on machines receive 5 to 7 cents, and foremen get 8 to 18 cents per hour.

Tapioca flour is shipped to the United States to be used chiefly for adhesives on stamps and envelopes.

Beer. The *Cervecería Nacional Dominicana C. por A.*, in Ciudad Trujillo, is the only brewery in the country. The invested capital is \$185,240, and yearly production as of 1939 was more than 1 million liters. There are 15 employees and 57 laborers. Products include beer, other alcoholic and non-alcoholic malt drinks, and various soft drinks, including Coca-Cola and Canada Dry products. The plant is modern, although small. It operates less than capacity, usually making a run of beer every two or three days.

Malt is imported from Canada. Hops previously were imported from various European countries and now come from California. Corn grits are imported from the United States. Carbon dioxide, which originally came from Germany, now comes from the United States and Puerto Rico. Bottles are imported from the United States.

The plant employs 70 to 80 persons working 54 hours a week. The plant may work overtime when special permission is obtained, but no increased wages for overtime are paid.

In 1939, the percentage of costs to sales, excluding taxes, was 41. When taxes of \$57,000 are included, this percentage is increased to 58. Average annual earnings per employee amounted to \$500, capital investment per job was \$2,570, and average annual sales per employee were \$4,750. Total costs were \$140,832.58, and wages were \$35,936.52. Employees numbered 72.

Wines. Statistics of the wine industry in 1939 follow:

Establishments registered	8
Establishments reporting	7
Capital invested	\$86,939.00
Wages	\$4,911.55
Total costs	\$14,765.58
Production, in gallons	14,830
Sales, in gallons	15,829
Value of product	\$20,232.72
Number of employees	8
Number of laborers	10
Cost as percentage of sales	73
Average price per gallon sold	\$1.28
Capital investment per job	\$483.00
Average annual wage	\$268.00

Although some wine grapes are grown in the provinces of Monte Cristi and Barahona, the alcoholic beverages made in the Republic and classified as wines are made from fruits, chiefly pineapples and cajules, and "improvement" of these wines by the admixture of colorings, flavors, and alcohol is accepted as general practice. According to agricultural experts, there are not enough grapes to permit commercial wine-making. It is also doubtful that a sufficient local market could be developed should vini-culture succeed, inasmuch as Dominicans who can afford wine consider the local product unsatisfactory. Export possibilities seem even less promising.

Imports of wines, chiefly from Spain, during the years 1936-39 were as follows:

	Amount (In liters)	Value (In dollars)
1936	85,686	29,694
1937	82,785	39,542
1938	77,891	29,880
1939	66,104	24,481

Alcohol and rum. Although various brands of Dominican "rum" seem to be the leading beverage offered in all the groceries, no rum is distilled directly from sugar-cane juices. Because of the law which bases the alcohol tax on the volume of the distillate, the distilleries turn out a product very high in alcoholic content, which is derived from molasses. This is mixed with water, color, and essential oils to make a beverage containing 40 per cent or more of alcohol. Efforts are being made to induce the legislature to change the method of taxation on alcohol to encourage the manufacture of true rum.

Cigars and cigarettes. Statistics on the cigar and cigarette industries are given below:

	CIGARS		
	1937	1938	1939
Establishments registered	52	40	46
Establishments reporting	52	40	46
Capital invested	\$153,688.00	\$208,571.45	\$200,450.00
Wages	\$111,291.56	\$109,505.16	\$100,151.43
Total costs	\$212,264.05	\$194,514.89	\$175,399.74
Production, in hundreds	317,042	252,906	240,768
Sales, in hundreds	312,401	247,540	249,022
Value of products sold	\$361,522.68	\$318,527.60	\$292,378.89
Costs, as percentage of sales, excluding taxes	58.6	61.0	60.0
Costs, as percentage of sales, including taxes	—	—	85.0
Number of employees	105	83	96

Number of laborers, including apprentices	737	1,057	578
Capital investment per job	\$182.50	\$183.00	\$296.00
Average annual wage	\$132.00	\$97.00	\$150.00
Value of products sold per job	\$430.00	\$280.00	\$433.00
Exports, in hundreds ¹³	438	208	412
Value of exports ¹³	\$905.00	\$627.00	\$530.00
Imports, in hundreds ¹⁴	16	14	242
Value of imports ¹⁴	\$130.00	\$87.00	\$159.00

CIGARETTES

	1937	1938	1939
Establishments registered	1	2	2
Establishments reporting	1	2	2
Capital invested	\$375,000.00	\$425,000.00	\$425,000.00
Wages	\$13,722.56	\$21,975.80	\$23,937.26
Total costs	\$136,005.10	\$165,196.75	\$190,197.05
Production, in thousands	223,096	235,322	234,814
Sales, in thousands	222,893	235,940	234,853
Value of products sold	\$941,883.90	\$1,008,822.73	\$1,041,244.37
Costs as percentage of sales, excluding taxes	14.5	16.5	18.2
Costs as percentage of sales, including taxes			62.3
Number of employees	45	55	58
Number of laborers, including apprentices	—	17	15
Capital investment per job	\$8,370.00	\$5,900.00	\$5,825.00
Average annual wage	\$305.00	\$305.00	\$328.00
Value of products sold per job	\$20,930.00	\$13,930.00	\$14,280.00
Exports, in 1,000 pieces ¹⁵	17,050	18,412	17,400
Value of exports ¹⁵	\$28,500.00	\$30,804.00	\$29,200.00
Imports, in 1,000 pieces ¹⁶	404	483	344
Value of imports ¹⁶	\$1,138.00	\$1,457.00	\$1,194.00

The largest cigar and cigarette factory is that of the Compañía Anónima Tabacalera in Santiago. In addition to various qualities of cigars, this company makes the two leading domestic brands of cigarettes, Cremas and Hollywood. Modern American machinery and United States (previously Spanish) cigarette paper are used. The cigars are made by hand, and dark cheap cigars for local demand are the chief product. Better brands are wrapped in cellophane and marketed in

¹³ 29,300 valued at \$813 in 1936 and 41,300 valued at \$534 in 1940.

¹⁴ Chiefly from Cuba; 600 valued at \$38 in 1936.

¹⁵ Chiefly to Dutch West Indies. 17,055,000 valued at \$28,637 in 1936; 17,400,000 valued at \$32,010 in 1940.

¹⁶ Chiefly from United States; 390,000 valued at \$1,213 in 1936.

boxes of domestic wood. Medium qualities are marked in paper bags containing 25 pieces.

The cigar section employs 180 persons, both men and women. Minimum wages were introduced in 1940. Wages for removing leaf ribs and for other preparation of tobacco leaves are based on weight or on number of leaves, while those for adjusting and packing are based on 1,000 pieces of cigars. The wages for actual cigar-making depend largely on the length of the cigar. The highest wage, \$4.00 per 1,000, is paid for cigars as long as $5\frac{1}{4}$ inches. A wage of \$2.00 per 1,000 is paid for cigars not longer than 4 inches with wrapper leaf closed and for cigars not longer than $4\frac{1}{2}$ inches if open at both ends. A good cigar maker may earn as much as \$1.20 per day of 8 hours. Men operating the cigarette machinery get the wages usual for skilled labor, approximately \$1.00 a day.

The local tobacco industry is protected by high tariffs. The chief problem of the cigar industry is that of obtaining good mucilage both for the cover leaf and for the bands which almost always are used.

Matches. All matches used in the Republic are made by the Fábrica Nacional de Fósforos in Puerto Plata, a company with \$200,000 capital equipped with all necessary machinery. The plant has a capacity of 150,000 boxes of matches per day of 8 hours, and when working at capacity employs 125 persons. When visited, the plant was working 3 days a week and employing 80 persons. Most of the workers get 50 cents a day, specialists receiving as much as \$1.00 to \$1.50. Apprentices are paid 30 cents a day. Despite slack operations and a tax of 1 cent per box (sold retail at 2 cents), stockholders were paid a 12 per cent dividend for the first half of 1941.

Because of the war there are some difficulties in obtaining chlorate from the United States. The prices of chemicals, purchased now in the United States, are said to be substantially higher than those obtained through the international (Krueger) match trust to which the Dominican plant formerly belonged.

In 1939 the percentage of costs (\$35,117.51) to sales (\$194,343.90, excluding taxes) was 18.1. With taxes of \$112,000 included, the percentage was 76. Average annual earnings per employee amounted to \$165, capital investment per job, \$1,785, and average annual sales per job, \$1,650.

Soap manufacture. The following table presents statistics of soap manufacture:

	1937	1938	1939
Establishments registered	18	20	19
Establishments reporting	15	13	18
Capital invested	\$272,304.11	\$216,879.31	\$216,800.00
Value of domestic raw materials	\$43,858.00	\$42,046.61	\$64,508.92
Value of imported raw materials	\$332,531.96	\$348,075.55	\$340,154.16
Wages	\$29,557.85	\$25,691.08	\$25,926.01
Total costs	\$422,838.64	\$441,660.49	\$464,368.68
Value of sales	\$437,804.65	\$481,326.05	\$524,050.02
Costs as percentage of sales	96.5	92.0	88.6
Number of employees	23	38	46
Number of laborers and apprentices	97	68	72
Capital investment per job	\$2,260.00	\$2,040.00	\$1,840.00
Annual sales per job	\$3,730.00	\$4,550.00	\$4,430.00
Average annual wage	\$246.00	\$242.00	\$220.00
Laundry soap produced, in kilograms	3,306,741	3,399,377	3,814,465
Value of laundry soap sold	\$447,191.83	\$459,409.58	\$493,270.21
Toilet soap produced, in kilograms	85,026	61,834	66,289
Value of toilet soap sold	\$26,612.82	\$21,916.47	\$30,779.87
Imports of fine soaps, in kilograms	99,975	85,834	141,074
Value of imports of fine soaps sold	\$47,200.00	\$41,080.00	\$68,954.00
Imports of common soaps, in kilograms	155,769	59,833	55,843
Value of imports of common soaps sold	\$17,792.00	\$5,793.00	\$4,821.00
Exports in kilograms . . . . .	..	..	260 ¹¹
Value of exports . . . . .	..	..	\$35.00

The soap plant of the Insular Trading Company, said to be the largest in the country, produces common as well as toilet and medicinal (sulphur, creosote) soaps under the trade name John Lahoud. It is equipped with two medium-sized soap kettles, one tank for dissolving caustic soda, about six relatively small cooling forms, several soap-cutting, -shaving, and -kneading machines, and small-scale equipment for the pressing of toilet-soap cakes. The soap shavings are dried in the sun. Many of the 40 employees are engaged in the inspection of the bars of toilet soap, removing the little spots caused by dirt, etc.

The plant uses tallow, coconut oil, and other raw materials imported from the United States. Glycerin, obtained as a by-product of the better grades, is discarded, and the cheap soap is not salted out. Cakes of toilet soap of the usual hand size retail at 10 cents, smaller cakes at 5 cents. Cheaper soap in the smaller size retails at 3 cents.

The soap factories import solid caustic soda, 76 per cent pure, in drums, each containing approximately 700 pounds. The price in 1937-38 was \$21 for 220 pounds. No separate figures for caustic soda are kept by the customhouse, which handles most of the soap raw materials as

¹¹ To Spain.

a single category, but imports of this product are placed at \$140,000 annually.

Samples of toilet soaps of various manufacture were found to contain solid particles of dirt which showed up during use. The soaps also crack somewhat. Ordinary laundry soaps, which retail at 12 cents a pound, are of low quality. There does not seem to be much possibility for further development in this field, unless the producers of the soaps now imported can be induced to establish small branch factories.

The total volume of glycerin wasted by the soap manufacturers in the Dominican Republic is estimated at about 14,000 gallons a year. Its distillation would become of interest if soap manufacture were concentrated in fewer plants.

Annual soap production and other data were not available. Wages paid for male skilled labor in Ciudad Trujillo were about 75 cents, and for female labor 40 to 50 cents for an 8-hour day.

Nails. The only nail factory in the Republic is that of Luis Martínez in Ciudad Trujillo. One of the few industries which depend completely on imported raw materials, it represents the largest metal-working establishment of the country. The factory, established in 1926 with a capital of \$45,000, is well planned, well organized, and uses up-to-date machinery. It employs 3 foremen and 25 laborers, but the plant has had to reduce operations temporarily because of difficulty in getting delivery of raw materials (wire and steel ribbons) from the United States, the sole supplier.

The normal sales of nails for carpentry and the shoe industry amount to \$120,000 a year, and the entire output is usually sold as soon as produced. In 1939 costs amounted to 82.5 per cent of sales, capital investment per worker was \$2,180, and average annual sales per worker were \$4,100.

The plant works 8 hours a day. Labor is paid \$1.00 a day, the shop superintendent \$30 a week, and his two assistants \$18 a week. Overtime, not more than 4 hours, is paid at double rate. Owing to the irregularity of the supply of wire and the frequent urgency of orders, periods of 12 hours of daily work follow periods of shutdown. As the company has to keep most of its staff of specialists whether work is done or not, cost of production and, of course, nail prices, have gone up considerably. The machinery is German-made. Only once was a trial shipment of German wire imported, and it proved unsatisfactory,

APPENDIX D

AGREEMENT BETWEEN THE DOMINICAN REPUBLIC AND THE DOMINICAN REPUB- LIC SETTLEMENT ASSOCIATION, INC. JANUARY 30, 1940

Ratified by the Dominican Congress in Special Sessions
at CIUDAD TRUJILLO, February 20 and 21, 1940.

AGREEMENT entered into this thirtieth day of January, nineteen hundred and forty, between the Dominican Republic (henceforth referred to as the "REPUBLIC") and the Dominican Republic Settlement Association, Inc., a corporation duly organized and existing under the laws of the State of New York, United States of America, (henceforth referred to as the "ASSOCIATION").

WHEREAS in 1938 His Excellency Franklin Delano Roosevelt, President of the United States of America, invited thirty-two governments to consult with the Government of the United States of America at Evian, France, regarding aid to refugees; and

WHEREAS these Governments constituted themselves as the intergovernmental Committee; and

WHEREAS His Excellency Rafael Leonidas Trujillo Molina as President and in the name of the Dominican Republic generously informed the intergovernmental Committee at its first meeting of the disposition of the Dominican Republic gradually to receive settlers up to 100,000 within its territory; and

WHEREAS the Intergovernmental Committee and the Coordinating Foundation of which the Hon. Paul van Zeeland is Executive President have shown a desire to avail themselves of the opportunity so offered by His Excellency Rafael Leonidas Trujillo Molina on behalf of his Government; and

WHEREAS the Republic and the Association are equally desirous to help and stimulate Jewish and non-Jewish settlers to establish themselves within the territory of the Dominican Republic and to make themselves citizens thereof; and

WHEREAS the Association is desirous to avail itself of the goodwill of the Republic for these purposes; and

WHEREAS this agreement has for its object the realization of said purposes; and

WHEREAS this agreement has been entered into in accordance with the Constitution, laws, decrees and other legal acts of the Republic and in their fulfillment, and consequently is invested with all legal power necessary or appropriate for its validity and compliance therewith;

THEREFORE the Republic, represented by Messrs. Mayor General José García, Secretary of State for the Interior and Police, and Raúl Carbuccia, Secretary of State for Agriculture, Industry and Labor, who have been duly authorized by the President of the Dominican Republic to execute this agreement in conformity with the laws of the Republic; and the Association, represented by James N.

Rosenberg, President, and Joseph A. Rosen, Vice-President thereof, who have been duly authorized by a resolution of the Association to execute and deliver this agreement in its behalf; hereby COVENANT AND AGREE AS FOLLOWS:

ARTICLE I

RIGHTS OF SETTLERS

The Republic, in conformity with its Constitution and laws, hereby guarantees to the settlers and their descendants full opportunity to continue their lives and occupations free from molestation, discrimination or persecution, with full freedom of religion and religious ceremonials, with equality of opportunities and of civil, legal and economic rights, as well as all other rights inherent to human beings.

ARTICLE II

SELECTION AND ADMISSION OF SETTLERS

(a) The Republic shall receive and give every possible opportunity and help to the Jewish and non-Jewish settlers in order to leave their present residences, to enter and reside in the Dominican Republic and to make their livelihood, establish their permanent homes and acquire citizenship in the Dominican Republic in accordance with its Constitution and laws. Settlements shall progress gradually in the course of the number of years which may be desirable or necessary in order that the settlers may be placed in position to establish themselves as citizens of the Republic and to reimburse the Association for its expenditures on their behalf. It is understood that the Republic shall not be responsible either to the Association or any other institution whatsoever for any of the financial obligations of the settlers to the Association or for payment to the Association of any disbursements in which it may incur.

(b) The Association shall have the right to select the settlers who will be chosen in accordance with their fitness and technical ability for agriculture, industry, manufacture and trades. The Association will from time to time submit to the Republic through the Secretary of State for the Interior and Police the names of settlers thus chosen with statements as to their place of origin, abilities, experience and whatever other data may serve for their identification and evaluation of their special qualifications. The Association assumes full responsibility for the correctness of this information. The Republic will within the most reasonably brief time, examine the information thus submitted and will promptly decide on its admission. As soon as this shall take place, the Department of Foreign Relations of the Dominican Republic shall instruct Dominican consular officers to provide said settlers with the proper documentation for their trip and admission to the Republic, including visas and other formalities which may assist them to travel from their place of residence to the Dominican Republic, and said consular officers shall issue these documents to the settlers free of all costs, fees, taxes and any other charges. All settlers whose admission shall have thus been approved shall be freely admitted into the Dominican Republic upon their arrival at the Dominican port of entry.

(c) There shall be admitted to the Republic as the first contingent in one group or separate groups approximately 500 families of Jewish or non-Jewish settlers.

There shall additionally and gradually later be admitted up to the number of 100,000 settlers in accordance with decision which in this respect shall be made jointly by the Republic and the Association. All settlers admitted to the Republic pursuant to this agreement shall have all rights granted and guaranteed by this agreement.

(d) The Association may furthermore recommend to the Republic the free admission in the manner previously stipulated of all those who may be specialized in their professions, trades or occupations, experts, artisans and other persons acceptable to the Republic.

(e) Infants of settlers born in transit shall have free right of entry and all benefits of this agreement.

ARTICLE III

TAXES

It is specifically agreed that the Executive Power of the Republic shall initiate a law to modify the Immigration Law now in force in order to exempt from all entry taxes, or similar taxes, present or future, the settlers covered by this agreement, who shall not be subject to any entry charges established by any subdivision of the Republic. Likewise, the Executive Power shall initiate a law by means of which there shall not be required of the persons who may come as settlers to Dominican territory, the deposits now required of navigation companies for the transportation of immigrants to the Dominican Republic, nor any other deposit of whatever nature, and so that these settlers may be permitted to bring with them, upon entering Dominican territory, free of duty and not for sale but for their own personal use in their agricultural enterprises and others incidental thereto, such furniture, personal effects, tools, equipment, materials and other instruments which they may need in order to establish themselves with economic solvency. It is understood that the present agreement shall become effective only after the Congress of the Republic shall have enacted, in accordance with the Constitution, the laws proposed in the present agreement, and likewise any other laws which may be necessary to give this agreement full legal force and validity.

ARTICLE IV

RIGHTS AND OBLIGATIONS OF THE ASSOCIATION

(a) It shall be the duty of the Association to take care of and promote the economic life of the immigrants who enter the territory of the Republic for their enterprises;

(b) The Association should maintain in the Dominican Republic an office or offices, and its representatives, experts, and other officials and employees shall enjoy full rights in order to carry out their mission within the territory of the Dominican Republic in accordance with this agreement and the Constitution and national laws of the Republic. Officers and employees of the Association shall receive from the Republic suitable documents enabling them freely and effectively to perform their duties, including travel within, to and from the Republic, and shall enjoy the cooperation of the Republic and its officials in the execution of their duties.

(c) The Association shall not be subject to the payment of any tax on property,

or other duties or contributions on the transactions or any other acts incidental thereto which refer exclusively to the fulfillment of the essential purpose of transporting and establishing within the territory of the Republic the settlers referred to in this agreement, or to the carrying out of projects of general interest in the establishment of said settlers, provided they do not imply competition with other similar activities open to private initiative;

(d) The Association shall pay and supply or cause to be supplied all funds necessary to cover transportation expenses of settlers, their disembarkation and their needs in the Republic, until such time as they may become self-supporting;

(e) The Association shall have the right to buy, lease, receive by donation, concession or exchange, alienate, and in general to acquire, possess or enjoy real or personal property, to burden, mortgage, lease, sell, sub-lease, or otherwise dispose of, and in general to cede any of these rights to settlers or groups of settlers; to loan monies to them, sell them properties or in any form deal with the settlers as the Association may deem necessary or convenient; to make regulations as to the mode of economic activities and conditions of granting loans, etc. etc., to settlers; and in general, shall have full rights to deal with the settlers and with others, as it may see fit, in accordance with Dominican law;

(f) The Association shall have the right to equip and maintain or otherwise dispose of places for the reception, training and education of the settlers; to construct for them adequate dormitories, school buildings, houses of worship, dwellings, experimental agricultural fields and in general supervise and promote the physical, social, economic and spiritual wellbeing of the settlers, as well as to organize, foster and assist purchasing, selling, credit, production, and consumption cooperatives and other types of cooperatives among the settlers.

(g) The President or Vice-President of the Association or their designees, when carrying out any project of the Association in respect of which the laws of the Republic may require action or intervention by the Government, shall get in touch previously with the department or official entrusted with taking cognizance of such case;

(h) Nothing said or stipulated in this contract shall be construed as meaning that the shareholders, officers, directors or employees of the Association are or will be subject to any personal or individual responsibility by reason of this contract or for the acts, deeds or omissions of the Association or of the settlers;

(i) It is understood that under the terms of this agreement the settlers are not to be considered in any way as employees of the association but merely as beneficiaries of its activities.

(j) The Association shall have the right to take such steps and to petition the Executive Power of the Dominican Republic as may be necessary in the personal or collective interest of the settlers until such time as they may have acquired Dominican citizenship;

(k) It is understood that the rights which settlers and the Association may acquire pursuant to this agreement or any acts thereunder shall not be abrogated by subsequent legislation, as the principle of non-retroactivity of laws established by Article 42 of the Constitution of the Republic does not permit it;

(l) The Association shall have the right to engage in any lawful activities which it may deem necessary or convenient to carry out this agreement.

ARTICLE V

COOPERATION OF THE REPUBLIC

(a) The Republic shall by all the means in its power, except when of a monetary nature, facilitate the efforts of the Association for the selection, construction and maintenance of adequate living quarters and other buildings which will so far as feasible be built with material existing within Dominican territory, and shall cooperate with the Association insofar as feasible for the proper employment of settlers in agricultural enterprises, construction of highways and other similar activities. The Republic, likewise, shall take appropriate measures through the departments of its administration to help in the selection of suitable lands for agricultural purposes and for the acquisition of said lands by the Association, and shall give its best assistance to the Association for the purpose of giving or obtaining desirable options to the Association for agricultural lands which may be deemed adequate and necessary for future large settlement.

(b) The Republic, in order to make this agreement effective and to insure the acquisition by the Association or settlers of suitable lands, buildings, water rights and other inherent rights, shall authorize and direct its appropriate departments to take such official measures as may from time to time be necessary or advisable in order to obtain and grant sound and valid titles, as well as the right to use said properties and to grant the Association and the settlers such rights, titles and benefits.

(c) The Republic hereby guarantees that all rights which may from this date be extended by the Republic to any other association, groups or agencies engaged in similar activities, will automatically thereupon accrue to and operate for the benefit of the Association and all settlers hereunder.

ARTICLE VI

VALIDITY AND EXECUTION OF THIS AGREEMENT

The present Agreement shall not bind the contracting parties until the following conditions have been fulfilled:

1. That this Agreement has been ratified by express resolution of the Board of Directors of the Association;

2. That the Congress of the Republic, within the free exercise of its constitutional rights, shall have enacted a law whereby persons who may come for the purpose of establishing themselves in the country under the protection of a colonization agreement are exempt from discriminatory taxation; and likewise a law whereby persons who may come as settlers to Dominican territory shall not be obliged to make the deposits at present required of navigation companies for the transportation of immigrants to the Dominican Republic, nor any other deposit whatsoever, and so that these settlers may be permitted to bring with them, upon entering Dominican territory, free of duty and not for sale but for their own personal use in their agricultural enterprises and others incidental thereto, such furniture, personal effects, tools, equipment, materials and other instruments which they may need in order to establish themselves with economic solvency; and furthermore, a law whereby associations organized for the establishment of colonies in the Dominican Republic shall be exempt from taxes on property or other duties or contributions on the transactions or any other acts incidental thereto

which refer exclusively to the fulfillment of the essential purpose of said associations of transporting and establishing settlers in the Republic; and that said laws shall have been duly promulgated and published;

3. That the present Agreement has been approved by the Congress of the Dominican Republic.

The present Agreement will come into full force and effect as soon as these conditions have been fulfilled, whereupon the Association, without further formalities on the part of the Republic, will proceed to engage in the activities mentioned in the present Agreement.

Done and signed in four originals, in Ciudad Trujillo, District of Santo Domingo, Dominican Republic, this thirtieth day of January, nineteen hundred and forty.

JOSÉ GARCÍA
Secretary of State for the
Interior and Police

RAÚL CARBUCCIA
Secretary of State for Agriculture,
Industry and Labor

JAMES N. ROSENBERG
President, the Dominican Republic
Settlement Association, Inc.

JOSEPH A. ROSEN
Vice-President, the Dominican Republic
Settlement Association, Inc.

WITNESSES:

For the Chairman

— RT. HON. EARL WINTERTON

For the Director

SIR HERBERT EMERSON

By STEPHANUS V. C. MORRIS

Secretary Intergovernmental Committee

FOR THE EXECUTIVE COMMITTEE

COORDINATING FOUNDATION

By HAROLD F. LINDER

Member of Executive Committee.

